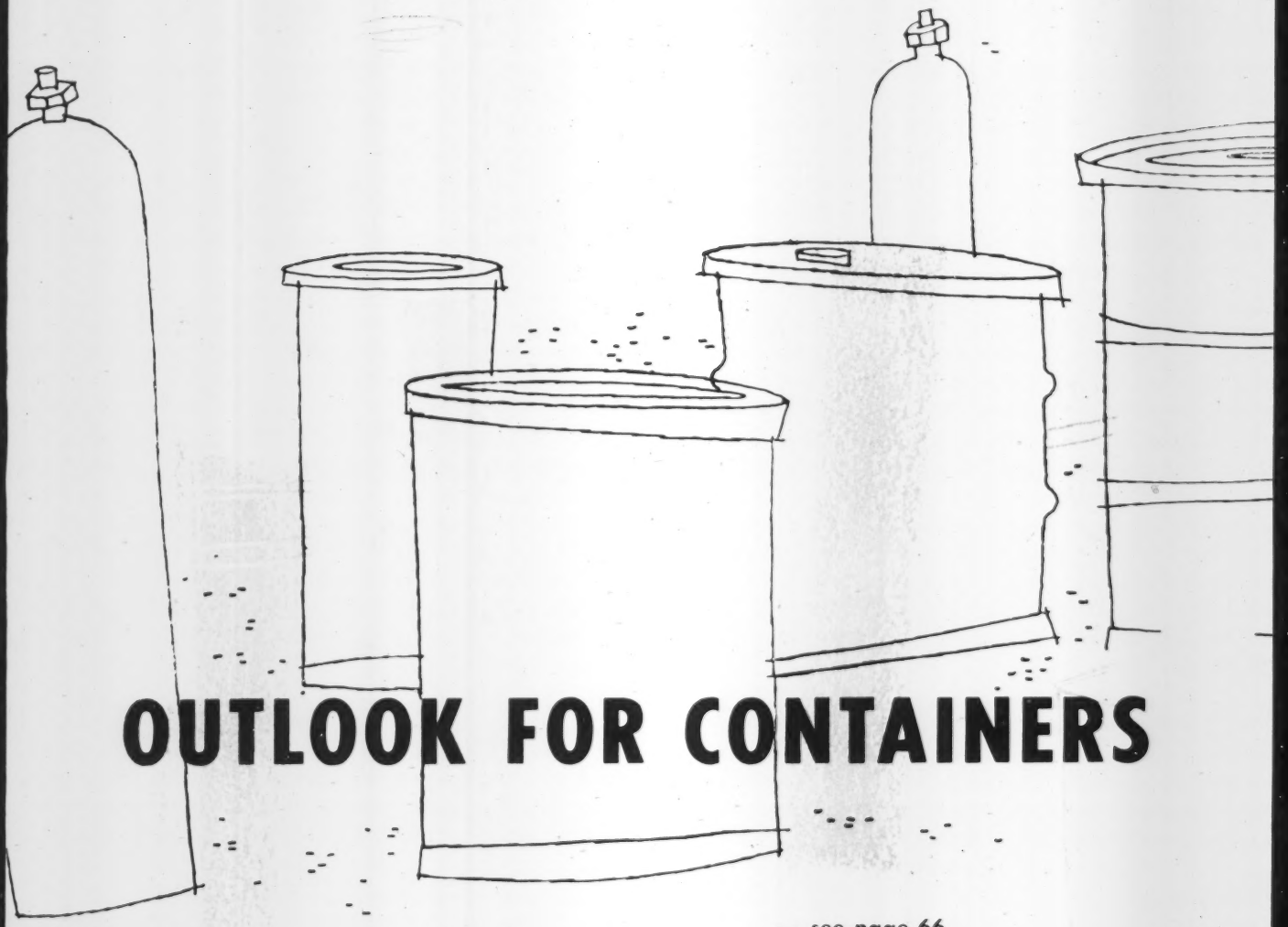
NOVEMBER 30, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



OUTLOOK FOR CONTAINERS

— see page 66

✓ **MODIFIED STEEL PRICING**
Republic Makes a Switch, p. 55

✓ **SAFETY DEVICES AREN'T ENOUGH**
Press Operators Must Know Limits, p. 101

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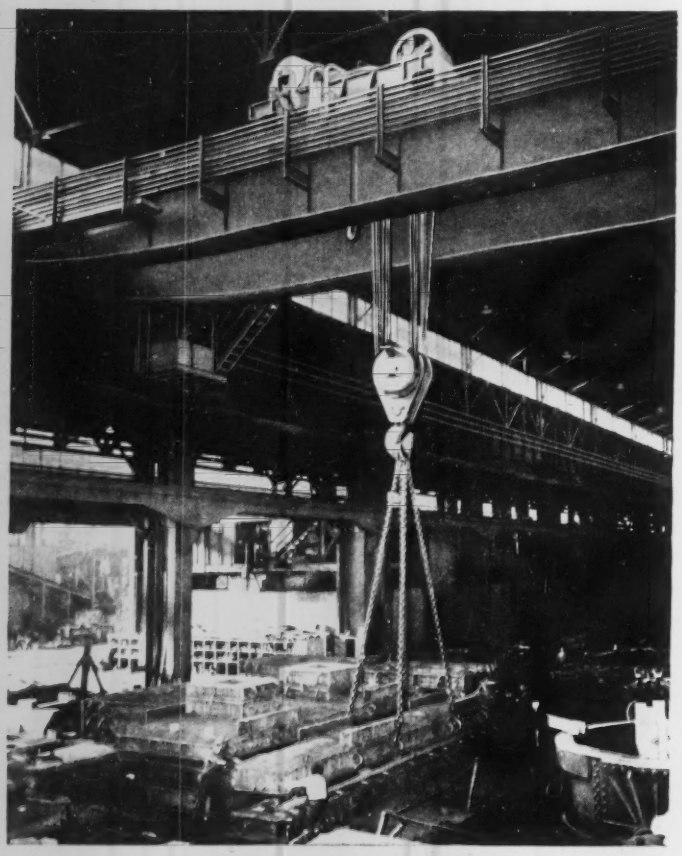
HEAVY LOADS SPOTTED QUICKLY, SAFELY



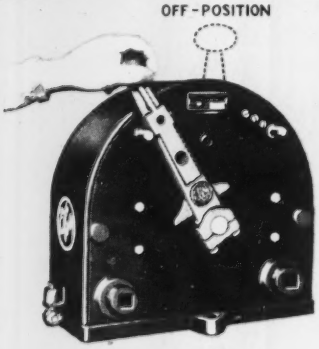
Here's Where EC&M CONTROL Gives Unexcelled Results

The EC&M Wright Dynamic Lowering Circuit Controller for crane-hoists is well known for its ability to permit accurate, short movements when spotting a load. The operator has complete control of all lowering speed-points. In setting the cope with this 125-ton crane, quick response through fast brake release enables the operator to close the mold carefully with a minimum number of movements which maintenance men recognize as a contributing factor to reduced up-keep. The Wright Circuit is safe specify EC&M Crane Control.

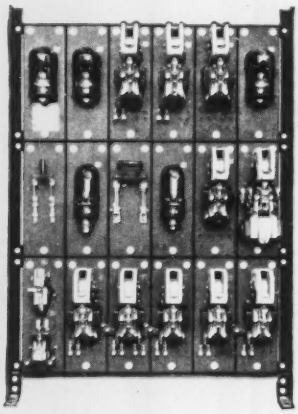
WRITE FOR BULLETIN 921

Photo — Courtesy, Cleveland Crane & Engineering

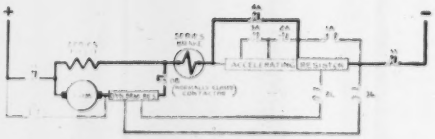
OFF-POSITION



Speed-control Master Switches have short throw —narrow width—and are convenient for the operator to use.

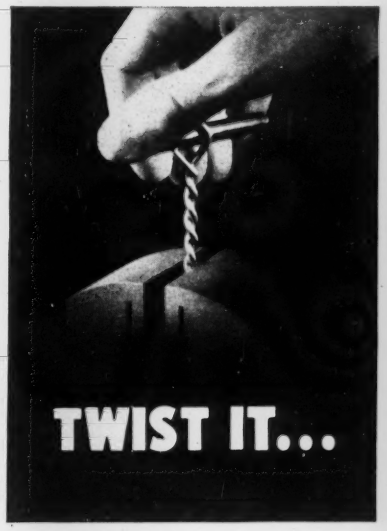


The Wright Dynamic Lowering Circuit Controller (with protection) for crane-hoists.

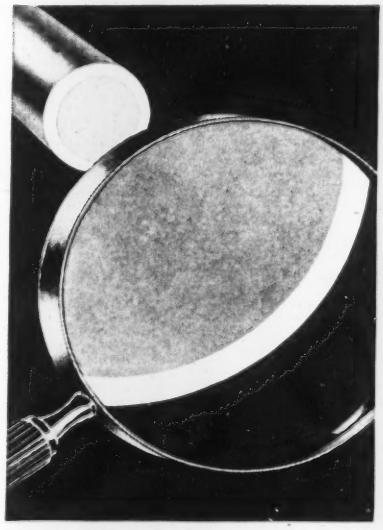


First point lowering connections put all the current from the line through the brake for fast release.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO



What makes it hold so tight?



The ductile coating of zinc on bethanized wire is undamaged, even when the wire is wrapped around its own diameter.

Bend a piece of bethanized wire, twist it, wrap it around its own diameter—even draw it to fine gauge—and the zinc coating stays put, without cracking, flaking or peeling off.

What makes the bethanized zinc coating hold to the steel wire so tenaciously? The unique electrolytic bethanizing process deposits virgin zinc on an electrolytically cleaned steel surface. The result is a zinc coating of high purity and exceptional ductility. It's integrally bonded to the steel base, proving that it is not necessary to have an iron-zinc alloy layer as a bonding agent.

Besides withstanding severe forming or fabricating operations, bethanized coatings are available in weights to fit your particular requirements. For example, we can supply a coating thickness much heavier than conventional galvanized coatings.

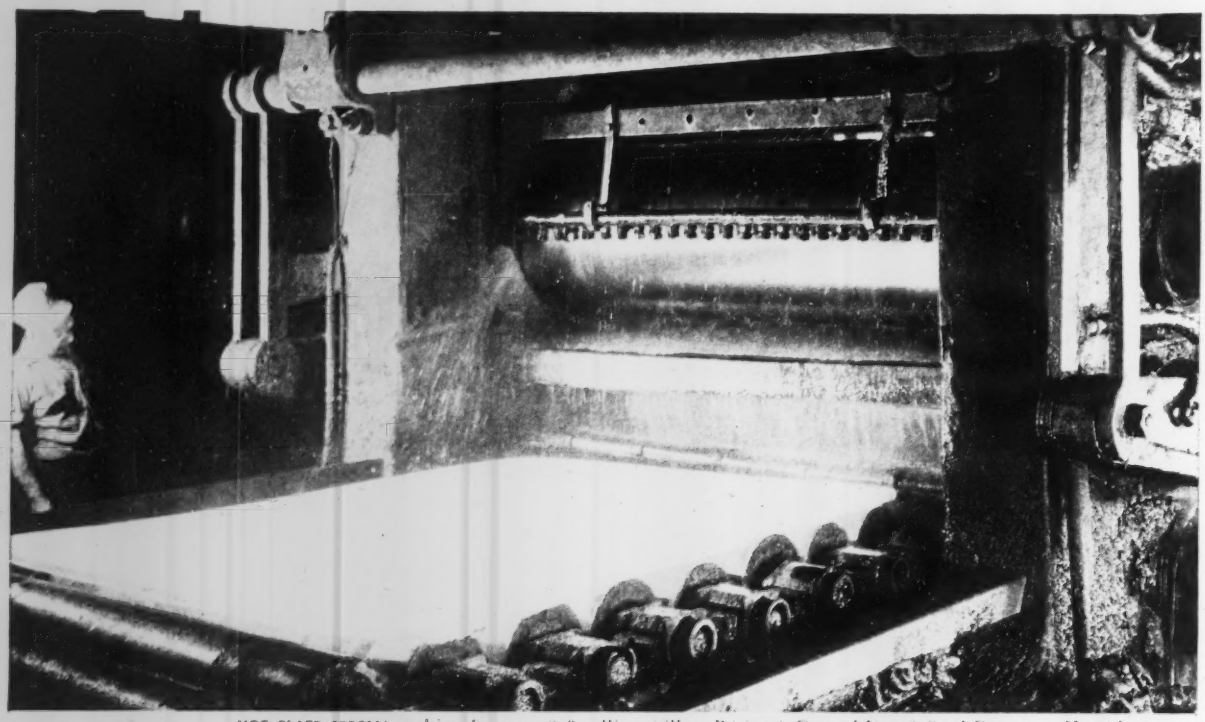
The two great advantages of the bethanized coating—its ability to withstand severe forming and fight off corrosion—make bethanized the ideal zinc-coated wire for many uses. Perhaps it may be the answer to one of your problems. A letter or phone call to the nearest Bethlehem sales office will bring you full information promptly.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributors: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHANIZED WIRE



HOT PLATE SPECIAL rushing from an 89" rolling mill at Barium's Central Iron & Steel Company, Harrisburg, Pa.

Here comes next year's luxury liner

Or a giant oil storage tank *or* a freight car *or* a bridge for a superhighway.

Wherever it goes, however, high-quality steel plate from Barium's 100-year-old Central Iron & Steel Company rates a warm welcome. And it goes nearly everywhere in basic industry—petroleum, transportation, shipping and construction.

Plate steel is only one of a long list of Barium steel products. In fact, few other steel companies make so many different things.

And when you deal with Barium, you draw on a 16-company reservoir of engineering knowledge and production experience hard to match even in much larger companies.

Maybe that's why so many essential products you see today—from tiny instrument springs to 20,000-barrel tanker barges—wear Barium nameplates. We'll be glad to tell you what's behind this name. Write Barium Steel Corporation, 25 Broad St., New York 4, New York.

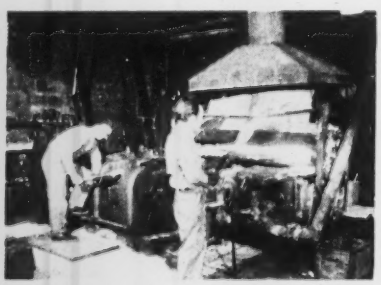
BARIUM STEEL CORPORATION

Sixteen integrated companies working in STEEL • MAGNESIUM • ALUMINUM • FIBERGLAS

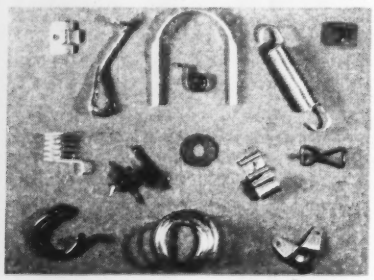
BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE, INC. • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. WILEY MANUFACTURING CO.

3.3

HAMMERING HOME its point is this drop forge at Barium's Globe Forge, Inc., Syracuse, N. Y. Globe forges a wide range of products, from automotive gear blanks to rocket components and tank parts, specializes in intricate customer-specified jobs.

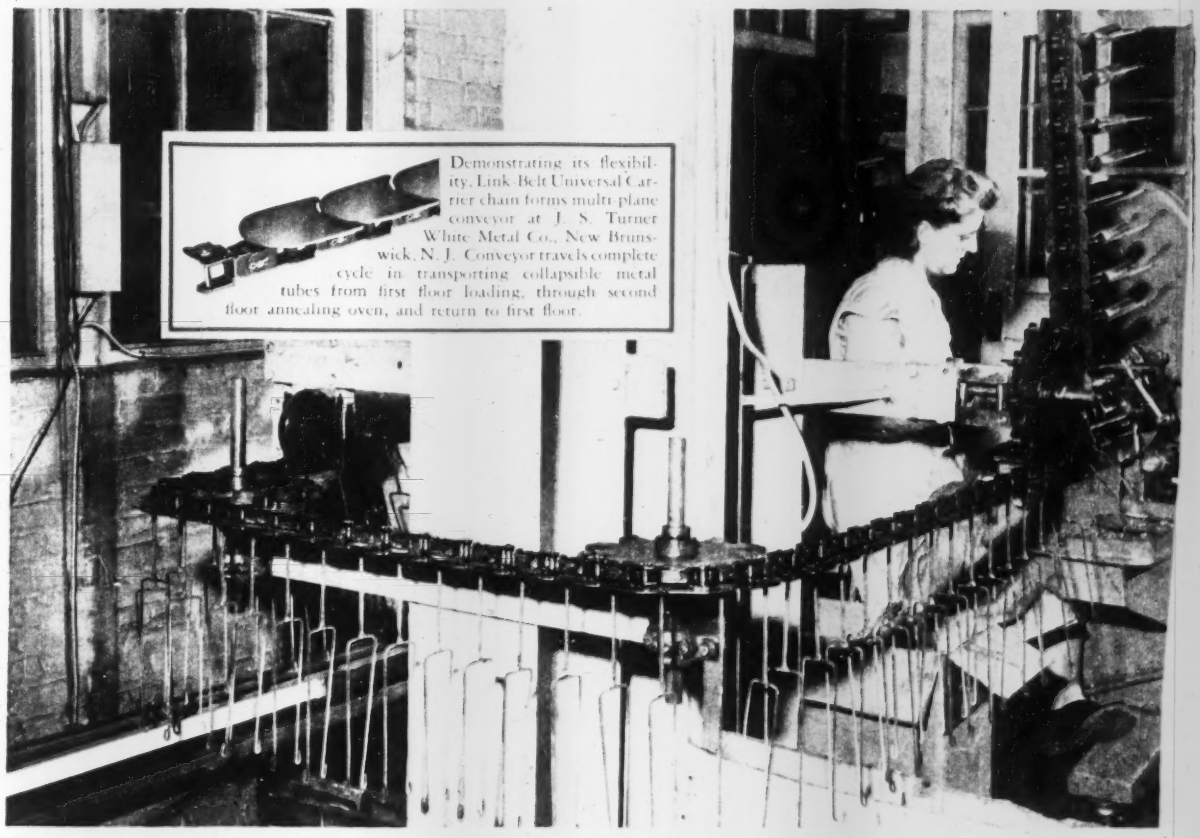


BIG BOLTS are these 2 in. diameter steel heavyweights being forged on an Acme machine at Barium's Bayonne Bolt Corp., Bayonne, N. J. Bayonne makes standard and special fasteners from 1/4 in. to 4 in. in diameter.



GROUP PORTRAIT showing a few of the almost endless variety of extension, compression and torsion springs, wire forms and flat springs made by Barium's Cuyahoga Spring Co., Cleveland, O. At middle right is famous Snap-Clip.

Is there ONE chain that best meets your drive or conveyor problem?



Demonstrating its flexibility, Link-Belt Universal Carrier chain forms multi-plane conveyor at J. S. Turner White Metal Co., New Brunswick, N. J. Conveyor travels complete cycle in transporting collapsible metal tubes from first floor loading, through second floor annealing oven, and return to first floor.

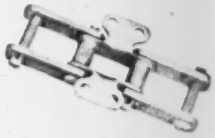
You'll find the answer in LINK-BELT's complete chain line... a size and type for every job

The application shown above is an example of how you can select the *one* chain best suited for a particular need from the complete Link-Belt line. And each chain is engineered to provide more efficient service at lower cost than so-called general purpose chain.

Whatever your requirements, you are assured of the *right* chain for the job when you rely on Link-Belt. And, remember—a chain bearing the Link-Belt double >——< arrow is your guarantee of longer chain life.

For information on the complete Link-Belt chain line, see the Link-Belt representative near you. He has the answers for efficient, low-cost drive and conveying chain performance.

Typical chains from the complete LINK-BELT line



Class C combination chain — popular, durable, low-cost design for elevators, conveyors.

Class 400 Pintle Chain — Closed end design keeps out dirt, makes excellent service medium for drives, elevators, conveyors.

Class SS bushed roller chain with offset side bars — for heavy drive service at moderate speeds.

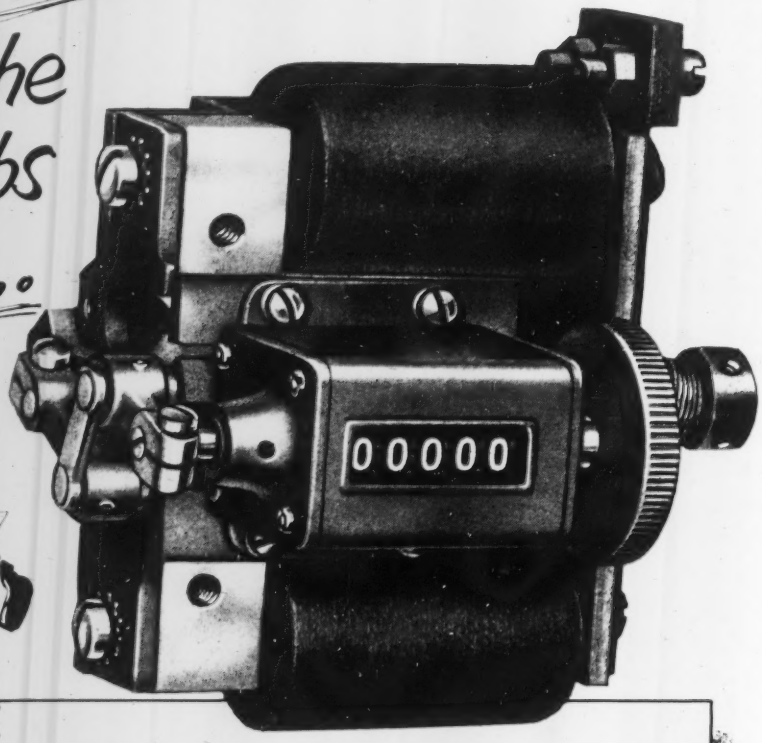
Link-Belt Precision Steel Roller Chain, standard pitch, for high-speed drives or conveyors.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

This Electrical Reporter Stays on the Tough Jobs Longer...



Added Evidence that

Everyone Can Count on VEEDER-ROOT

Compact and rugged . . . this electrically operated reset counter is specially designed for tough jobs that demand longer counter life.

Here's another instance of the *infinite applicability* of Veeder-Root *Count*rol — electrical, mechanical or manual. And here's another instance, too, of the endless resourcefulness of Veeder-Root engineering, and the ability to design a *complete counting package* that fits the job fully and exactly. Now . . . what's *your* problem?

VEEDER-ROOT INCORPORATED

"The Name That Counts"

HARTFORD 2, CONNECTICUT

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Montreal 2, Canada • Dundee, Scotland
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This Week in Metalworking

STEEL

Vol. 133 No. 22 November 30, 1953

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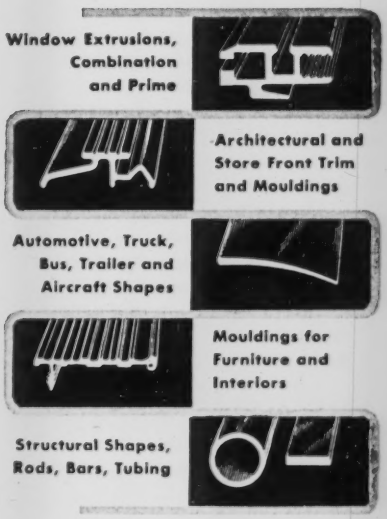
PE ALUMINUM EXTRUSIONS
designed and produced to fit your needs


Window Extrusions, Combination and Prime
Architectural and Store Front Trim and Mouldings
Automotive, Truck, Bus, Trailer and Aircraft Shapes
Mouldings for Furniture and Interiors
Structural Shapes, Rods, Bars, Tubing

If your production requirements call for a specially-designed aluminum extrusion, the skill and experience of PE design engineers and production men are available to you to help answer your specific needs. Or, it may be that a solution to your requirements can be found among the 4000 standard rods, bars, shapes, and tubing currently cataloged by Precision Extrusions and available without additional die service charge.

PERSONALIZED SERVICE and specialization in aluminum extruding assures you of prompt handling of your inquiry, careful production supervision, and extrusion quality meeting the highest standards of the industry.

COMPLETE FACILITIES include design engineering, die making, billet casting, extrusion production, and standard finishing operations.

ENGINEERING ASSISTANCE is available without obligation. If your present or future plans call for quality aluminum extrusions in standard or special shapes, call on PE, or *write, on your company letterhead, for our new complete catalog.*

QUALITY • SERVICE
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PRECISION EXTRUSIONS
BENSENVILLE, ILLINOIS
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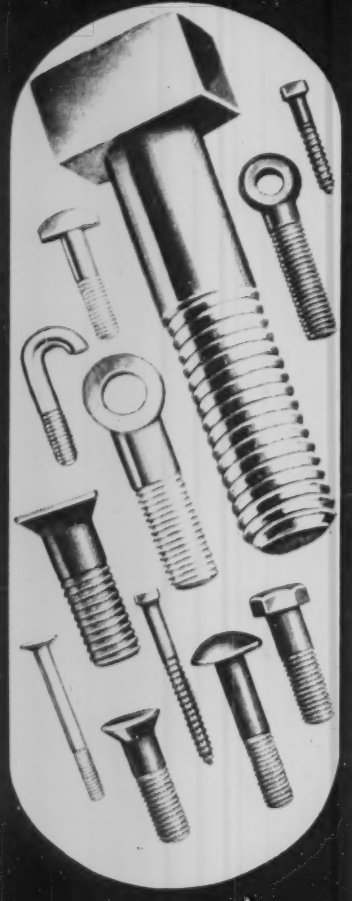
THREADED SPECIALTIES

TEE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost tee-head bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket tee-head bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit, if required.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MAN"

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

TM REG.

behind the scenes

Always at Your Service

Have you had a good chance to really study the *Machine Tool Buyers' Guide* you received as a supplement to your Nov. 16 issue of STEEL?

Many of our readers have, and their superlative comments bring new pep and sparkle to the chatter of our laboring typewriters.

The *Guide for Machine Tool Buyers* is the latest in a series of reference works prepared by the editors of STEEL to help you in the every day performance of your job. Some of the others, you will remember, were *Guide for Carbon Steel Buyers, Guide for Stainless Steel Buyers, Guide for Tool Steel Buyers* and, of course, the extremely popular *Specifications Handbook*.

Just for the record, you might be interested in knowing a little of the "behind the scenes" effort that went into the publication of the *Machine Tool Buyers' Guide*. Its preparation involved months of preliminary planning and testing to find out just what reference information would be helpful to machine tool users.

It was discovered that nowhere were there lists classifying machine tools by size, type and manufacturer. Checks with machine tool users and builders indicated that this type of information was needed and desired.

There followed an exhaustive search for all the machine tool builders in the United States. This research uncovered nearly 600 companies, of which more than 10 per cent later proved to be out of business or no longer making machine tools.

In addition to the basic buyers' guide type of information, it was learned that machine tool users wanted to know more about trends in machine tool features, trends in production methods, trends in machining methods, trends in types of machine tools, trends in tooling and other related subjects.

To secure this information, a tremendous mail study was undertaken. The survey, as reported in the *Buyers' Guide* issue, reflects the practices and thinking of 2104 companies. These, of course, provide a representative cross section of the 14,334 metalworking plants which perform machining operations.

The mail questionnaire was supplemented, and verified, by field interviews by STEEL's editors.

We are proud of this new addition to the STEEL family of reference guides. We hope you like it too.

King-Size Quote

We've learned to assume a blase, "why-of-course" attitude when some friend or associate remarks, "Did you see that the *Cleveland Press*, or *Seattle Journal*, or the *New York American* or the *Chicago Tribune*, or even the *Pollyquote Clarion* carried an item quoting STEEL magazine?"

It happens quite often, we are pleased to report.

We weren't quite prepared, however, when Vance Bell, assistant managing editor, bubbled into our nook and cranny yesterday carrying a newspaper clipping that looked like an uncoiled roll of two-inch bandage. It was the most king-sized newspaper clipping we had ever had the pleasure of seeing and all 18 column-inches of it quoted STEEL on the subject of steel production.

The article appeared in the Nov. 16 issue of the *Lorain Journal*. Fine paper, that *Journal*!

Behind the Seams

The grapevine brings us word from the fabulous city of Houston in the fabulous state of Texas that a new monthly trade publication will soon be issued for the sewing machine and vacuum cleaner industries.

The name of this publication? *Behind the Scenes*, no less. Now we don't want to appear mad, because we really are. But it just makes sense to us that instead of picking up the name of our little ole column, those Texas gentlemen might better have settled for something like "Behind the Seams". Seems like seams are much more fitting for sewing machine and vacuum cleaner people.

Shrdlu

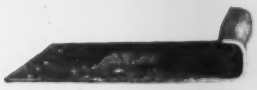
(Metalworking Outlook—Page 47)

THESE COMPARISONS PROVE

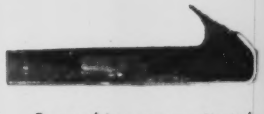
the superiority of VERSON-WHEELON rubber pad forming...

Formed in a Verson-Wheelon Press

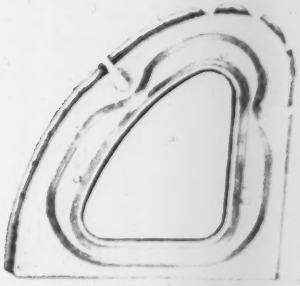
Formed in a conventional rubber pad press



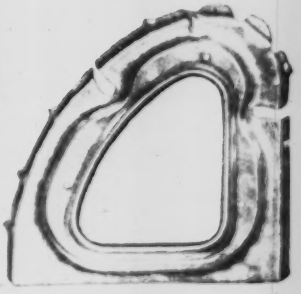
Formed in a Verson-Wheelon Press



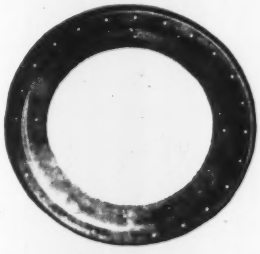
Formed in a conventional rubber pad press



Formed in a Verson-Wheelon Press



Formed in a conventional rubber pad press



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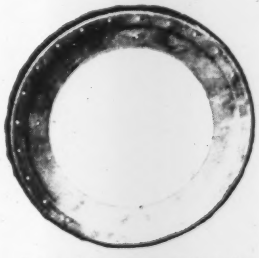
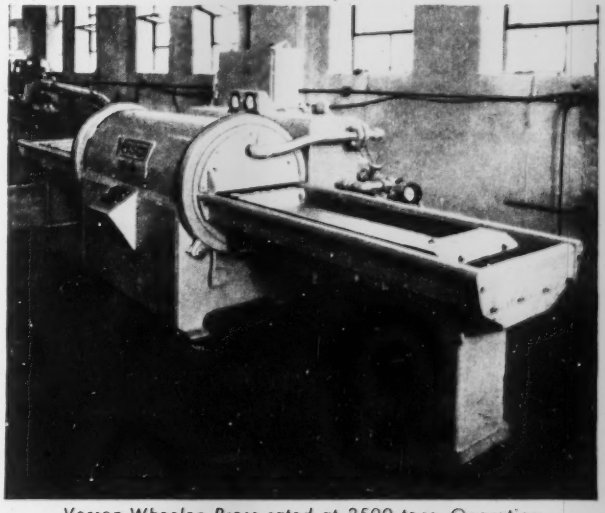


Formed in a conventional rubber pad press

The best way to judge the new Verson-Wheelon Direct Acting Hydraulic Press is to compare its work with that of a conventional rubber pad press. The typical examples illustrated above show the difference. Flanges of Verson-Wheelon formed parts are completely formed. Flanges formed in a conventional rubber pad press are often wrinkled and incomplete and require considerable hand finishing.

Add to this the substantially lower price of the Verson-Wheelon unit, its compactness and its elimination of the need for an expensive foundation and you'll see how economy has been combined with superior performance.

Bulletin VW-52 gives design and operating data. Write for a copy.



Verson-Wheelon Press rated at 2500 tons. Operating pressure is 5000 psi. Tray size is 20" x 50". Larger tray sizes and higher pressures are also available.

A Verson Press for every job from 60 tons up

Verson

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

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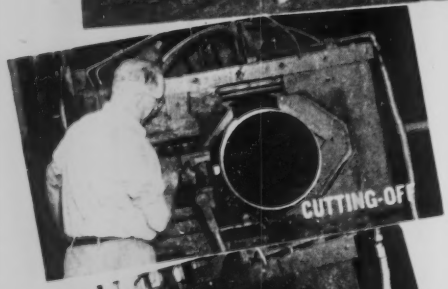
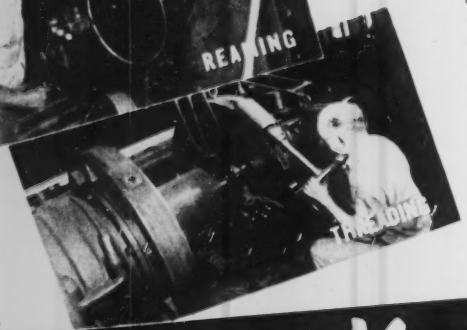
MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

LANDIS PIPE THREADING MACHINES





. . . 4 Major Features Increase Efficiency

1. WIDE RANGE—Just three LANDIS Pipe Machines (2", 8" and 18") will thread all diameters of pipe from ½" to 18". Each machine is constructed so as to handle a wide range of pipe sizes—for example, the 6" machine will thread all diameters from 1" to 6". Universal size adjustment allows quick set-up.

2. DIE HEAD EFFICIENCY—The design of Stationary heads provides maximum rigidity on all diameters within their range. Positive locking action is assured through a self-locking toggle joint. Size adjustment is quickly and easily obtained through the use of a single locking nut.

3. LOW TOOL COST—Chasers operate at a tangent to the work. Line contact at cutting edge reduces friction. Permanent throat assures even chip distribution. Variable rake affords proper cutting edge for different materials. Landis chasers are useable for 80% of their original length. They are individually replaceable and, within the range of a given die head, a single set can be used for all diameters of the same pitch, form and taper.

4. PRECISION TAPERED THREADS—The Receding Chaser Pipe Machines are especially designed to cut tapered threads to meet A.P.I. requirements. Chasers recede into the die head at a rate equal to the taper of the thread, ensuring accurate and uniform taper along the full thread length.

50th ANNIVERSARY

LANDIS *Machine* CO. WAYNESBORO PENNSYLVANIA

"Save money? Sure!"

THAT, in a nutshell, tells you why so many wire rope users in the industrial fields prefer Roebling wire rope . . . it speeds up operations . . . lasts longer on the job . . . saves money that really adds up.

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fire is ready to strike!

At dip tanks,
switch gear,
transformer vaults.

Your safest move is to
install a KIDDE
fully-Automatic CO_2
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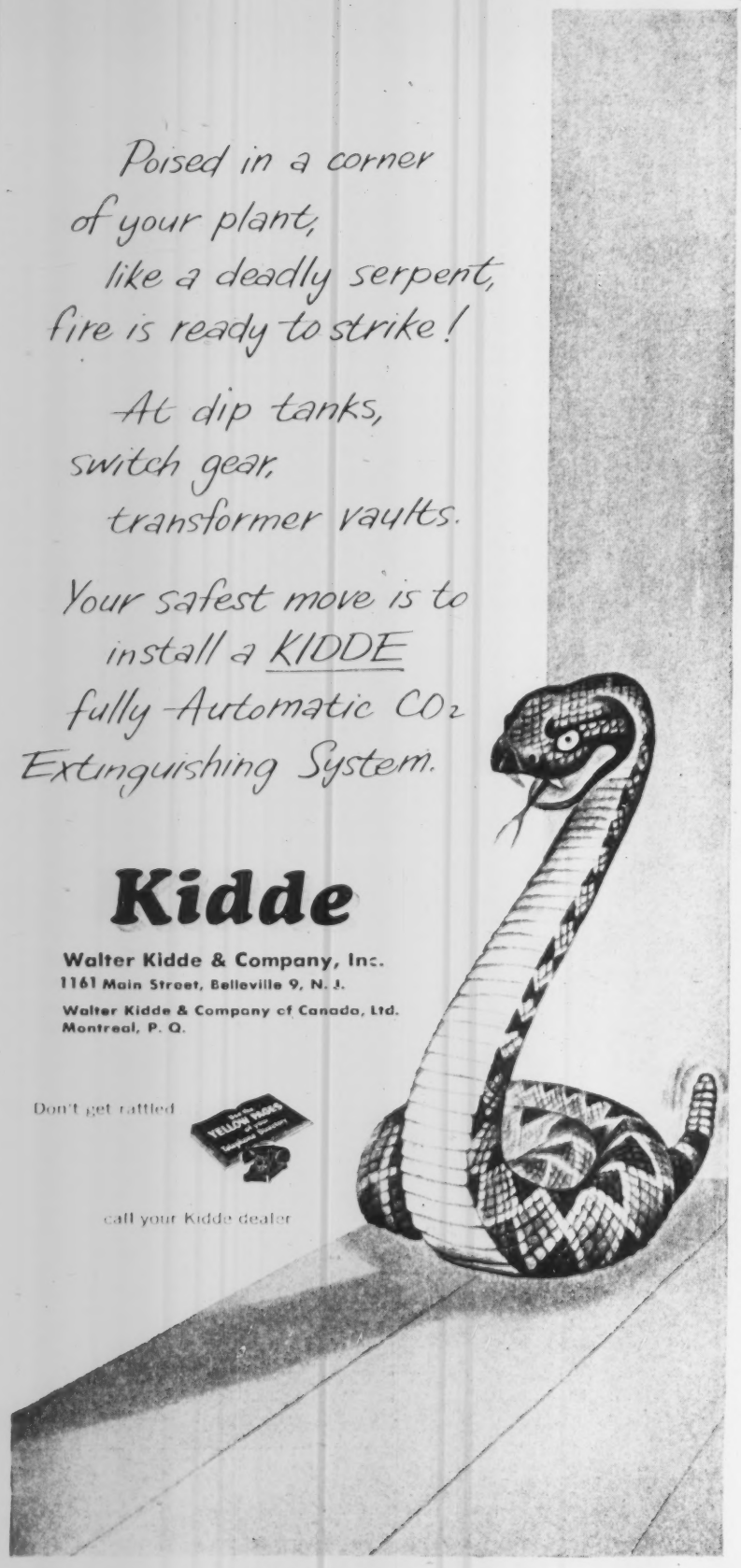

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LETTERS
TO THE EDITORS

Quick Reaction on Tool Guide

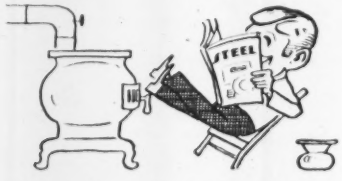
The "Machine Tool Buyers' Guide" (Nov. 16, Section II) is the most comprehensive report I have even seen on machine tool users. I want to congratulate STEEL for the excellent job.

Copies of the "Machine Tool Buyers' Guide" will no doubt remain on the desks of our important customers and prospects for months to come. I feel certain they will prove to be a valuable source of information.

Alex Stanley
D. A. Stuart Oil Co. Ltd.
Chicago

• *Extra copies of the "Machine Tool Buyers' Guide" are available from STEEL's Reader Service Department for $1.00 a copy.—ED.*

Well Read at Heater Division



"Gas Plating Offers Versatility" (Oct. 19, p. 120) has intrigued my imagination and curiosity to the point where I would like some information on operating costs and specific applicability. Could you furnish the name and address of a person capable of giving me this information?

Incidentally, congratulations on your very fine publication. We at Bryant find it extremely informative.

Paul Broadstone
methods engineer
Bryant Heater Division
Affiliated Gas Equipment Inc.
Tyler, Tex.

• *Write to H. A. Toulmin Jr., Commonwealth Engineering Co., Dayton, O.—ED.*

Enthusiastic Over Handbook

I received a copy of STEEL's Specifications Handbook in today's mail. After cursory study it seems that STEEL has produced a very complete yet compact manual.

M. P. Lammers
Bearings Inc.
Cleveland

Your recent STEEL's Specifications Handbook has certainly met with a great deal of enthusiasm here. It is an excellent source of material needed in much of our work.

Edward S. Harris
Rodney Hunt Machine Co.
Orange, Mass.

Letter Spurs Interest

In reading an article "Management Buys the Series" in your "Letters to the Editor" column (Oct. 26, p. 10), I became interested in getting a copy of "Buy Your Way to Lower Costs" (May 25, p. 105) No. 4 in STEEL's Pro-

Please turn to p. 12

Gardner Grinding increases production from 50 to 180 pieces per hour!

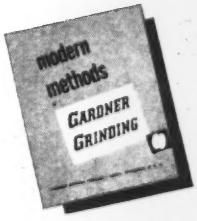
Replaces 2 milling operations on universal joint yokes

GARDNER precision disc Grinders

121M

WORK DATA

MACHINE	No. 125-26" Gardner Double Spindle Grinder
PART	Universal Joint Yokes for automobiles and trucks
OPERATION	Grinding two parallel sides of yoke simultaneously
STOCK REMOVAL	.030" maximum overall
TOLERANCES	.0015" to .002" for squareness with hole; .001" to .0015" for uniformity; .003" or better for concentricity with splined hole
PRODUCTION	180 pieces per hour
TOOLING	Power operated sliding work table with work holding fixture



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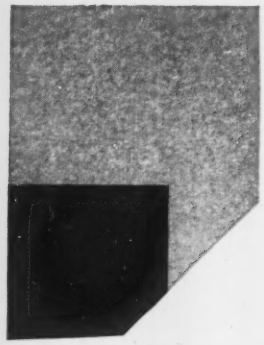

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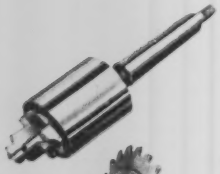

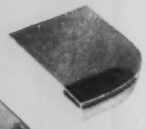

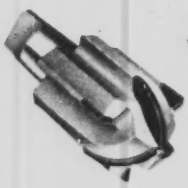

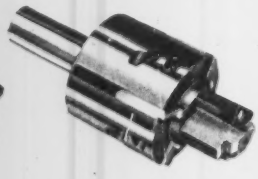

When your production machining problem dictates the use of special carbide tooling, your nearby Gorham Field Engineer can give you the right answers fast! He's an expert in the design and application of special cutting tools . . . and he provides a complete engineering service to determine your exact requirements.

He begins with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and required finishes and tolerances. He plots speeds, feeds and methods of tool driving. Then he develops practical design and metallurgical specifications for a special tool that's "tailor-made" for your application. And his recommendations are backed by Gorham's more than thirty years' experience in the design, manufacture and heat treatment of fine cutting tools.

Yes, your nearby Gorham Field Engineer is a helpful man to have around! If you haven't yet met him, write for his name, or send details of your problem direct, and we'll have him get in touch with you promptly.

Gorham TOOL COMPANY

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WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from p. 10

gram for Management. And if it is possible, will you also send me reprints of the preceding three articles in this series.

L. Genoff
assistant works manager
Ralston Mfg. Co.
Belmont, Calif.

• *Sent.—ED.*

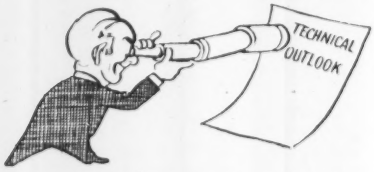
Available for Guidance

This is to ask your permission to reprint your article in three installments, "Guide for Selection of Carbon Steel Bars" (Sept. 14, 21 and 28), for circulation to our organization.

C. G. Ollinger
National Carbon Co.
New York

• *Permission granted. A limited quantity of this guide is still available in reprint form from* STEEL*'s Reader Service Department.—ED.*

Technical Outlook Draws Reader



In the Nov. 2 issue "Technical Outlook," mention was made of a new tool steel being developed by the Vanadium-Alloys Steel Co. ("Free-Machined Tools," p. 89). I am very interested in any developments along this line and would greatly appreciate any further information that is available.

C. A. Mangio
principal metallurgist
Battelle Memorial Institute
Columbus, O.

• *Contact Dr. George A. Roberts, chief metallurgist, Vanadium-Alloys Steel Co., Latrobe, Pa., for further information.—ED.*

In your Oct. 5 issue "Technical Outlook" appeared the article "Under Wraps" (p. 87), referring to the use of electric blankets to retain friction-induced heat in cold-rolled sheets between shifts and over weekends. We have written to several steel companies and they have indicated that they did not know of such an application. We would like to know the names of the firm or firms making this application.

G. R. Dolan
chief engineer
Neco Electrical Products Co.
Bay Springs, Miss.

• *Write to R. F. Sambleson, General Electric Co., Bridgeport, Conn.—ED.*

In the "Technical Outlook" for Nov. 9, I noticed an article on a booklet and wall chart on chip formation and breakage ("In the Chips," p. 111) that is available through the National Machine Tool Builders' Association. I would appreciate your sending me that organization's address.

William H. Griffith
Kaiser Aluminum & Chemical Sales Inc.
Oakland, Calif.

• *They're available through the National Machine Tool Builders' Association, 10525 Carnegie Ave., Cleveland.—ED.*

Photos courtesy Kirk & Blum, Cincinnati, Ohio

72 HOLES

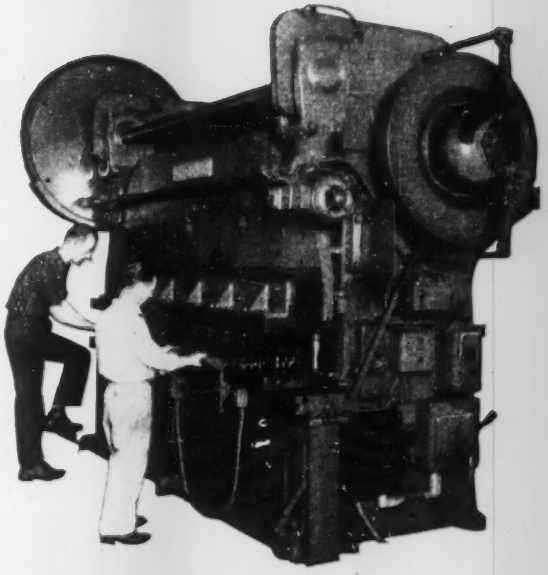
where they belong

Economical assembly depended on maintaining the accurate spacing of these 72 holes and their accurate positioning on this 10-gauge sheet.

This Cincinnati Press Brake is giving a high production at low cost by its speed and accuracy of performance, which insures rapid low cost assembly.

As a press, they offer high production with low investment. As a Press Brake, their low set-up costs, quick change-overs and versatility bring profits.

Write for Catalog B-4 where many examples of the versatility of Cincinnati Press Brakes are illustrated.



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THE CINCINNATI SHAPER CO.

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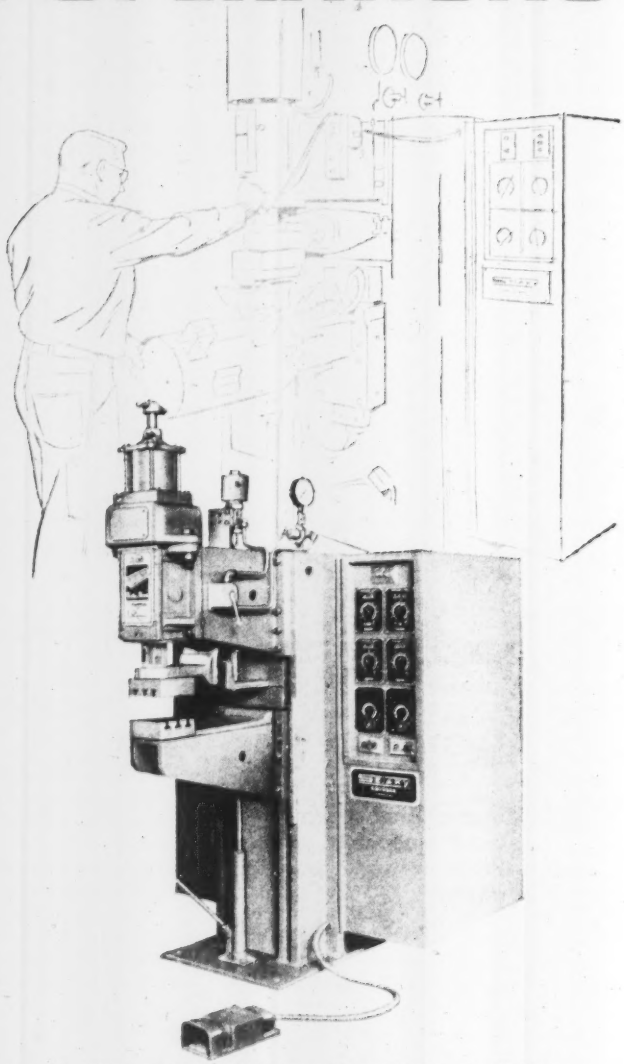
SEVEN DIFFERENT PRODUCTION OPERATIONS ON ONE STANDARD WELDER



Versatile Sciaky Standard Three-Phase Projection Welder Sharply Reduces Tooling Costs

With typical efficiency, Moloney Electric Company uses a minimum number of Sciaky machines for a maximum number of welding operations.

After careful study, Moloney found Sciaky electric resistance welding offered many advantages over other methods of fabrication. Sciaky patented Three-Phase principle of operation provided automatic compensation for variation in material thickness, piece-part configuration, and fit-up to improve weld quality and machine versatility.

Only Sciaky Three-Phase characteristics of balanced line load, high power factor, and 75% current reduction permitted such extensive use of resistance welding with existing power supply.

Now Moloney pressure-tight transformer tanks, from 10" to 30" in diameter, and 21" to 54" in height, are fabricated almost completely on Sciaky Three-Phase welders.

For complete details on the efficiency and economy of Sciaky resistance welding at Moloney, write for "Resistance Welding at Work", Volume 3, No. 7.

*Sciaky type PMCO 2T Three-Phase Projection Welder joins seven different parts to Moloney Transformer Tanks. A two-switch foot pedal provides immediate selection of preset heat and pressure sequences for different welds without removing tank from welder or stopping production to reset controls.

Largest Manufacturers of Electric Resistance Welding Machines in the World

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Plants: Chicago • London • Paris Sales Offices: Chicago, Ill. • Buffalo, N. Y. • Cleveland, Ohio • Dayton, Ohio • Detroit, Mich. • Ft. Worth, Texas • Hollywood, Calif. New York, N.Y. • Philadelphia, Pa. • Washington, D.C.

CLEAN EDGES WITH A GOOD CUTTER-BUT CLEAN JOBS DEPEND ON

GOOD PIPE

ON the job or in the shop, you like to work with Youngstown pipe. Cutting is clean, fast and easy because Youngstown pipe is uniformly round and soft—true to size, even in grain structure, free of inclusions and hard spots. The name "Youngstown", rolled into every length, means GOOD PIPE.

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7 POINTS OF UNIFORM GOODNESS IN
YOUNGSTOWN STEEL PIPE

uniform ductility - - uniform lengths - - uniform threading - - uniform weldability - - uniform wall thickness and size - - uniform strength and toughness - - uniform roundness and straightness

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S&W SMALL CONVEYOR FURNACE

(3" BELT)

Saves Labor Costs Speeds Production!

IDEAL FOR JEWELRY PRODUCTION

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USED IN GENERAL INDUSTRY FOR PRE-PRODUCTION AND EXPERIMENTAL WORK

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See S&W for ALL your furnace requirements!

S&W builds a complete line of industrial furnace equipment. *Typical furnaces manufactured include* conveyor, batch, pusher, and strip types. Powered by gas, oil, electricity. *Used for* brazing, annealing, bright annealing, hardening, soldering, nitriding, drawing, sintering, many other processes. Made in a variety of sizes and capacities to meet your needs.

Other S&W Equipment includes: Gas Generators, Ammonia Dissociators, and Gas Conditioning Units.

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FOR EXTRA FLOOR SPACE...

The "SAVE-WAY" to move Materials is the *Ceiling Way!*

MANY plants are crying for extra floor area, yet not using half of their cubic footage. Except for piping, wiring and air circulation, the upper ceiling space is largely wasted.

The more activity that can be transferred to this overhead space, the more floor area will there be for other purposes. This permits adding more production tools without plant expansion, storing more materials, removal of floor confusion, increasing output and other advantages.

Materials handling is an activity that can be done very efficiently overhead. That is one reason why Cleveland Tramrail equipment is so popular. Not only does it serve well without using valuable floor space, but it speeds handling, greatly lowers cost and is a great aid to safety.

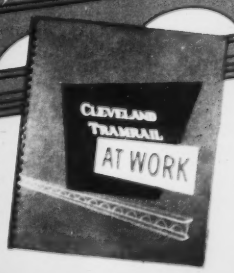
A Cleveland Tramrail engineer will be glad to discuss with you the "Save-Way" of moving materials, without obligation.

Investigate the Possibilities of

CLEVELAND TRAMRAIL

... the Overhead Track to *Lower Production Costs*

Let us mail you this booklet. Packed with helpful data. Ask for No. 2008.



This large book is the greatest in its field. Contains a wealth of valuable information. Covers details of 91 outstanding installations. Has 252 large photos, 38 system layouts, 59 other sketches. Write for "Cleveland Tramrail at Work." A nearby representative will deliver it without obligation.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
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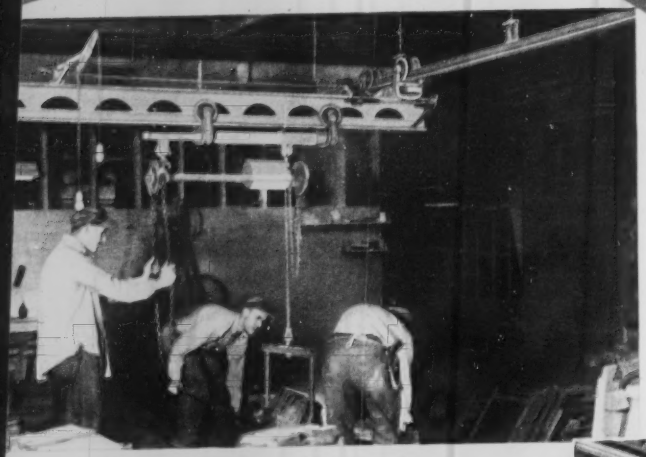
Are YOU paying for Overhead Handling *Without having it?*

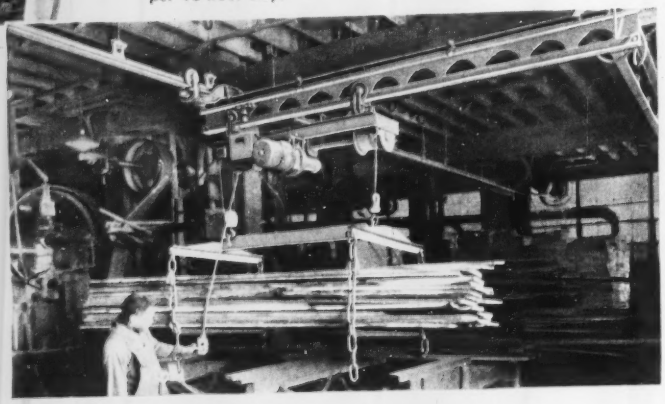


Hundreds of plants are in effect making sizeable payments on materials handling equipment every month without getting it. The payments are the extra costs incurred through inefficient handling losses. Have a Cleveland Tramrail engineer study your plant handling. Make sure you are not dissipating profits on outmoded ways of handling.

Savings Like these Can Be Yours!

Lumber Crane Pays for Itself in 13 Weeks

In just 13 weeks the entire cost of the one-ton hand-propelled crane, illustrated below, with electric hoist, crane runway and erection was absorbed because of the efficiency introduced in handling lumber the overhead way. 10,000 feet are handled per 10-hour day.



Foundry Jumps from 3 Heats to 8 Daily

With no increase in man-power, the installation of an inexpensive Cleveland Tramrail hand-propelled system in a small brass foundry made a terrific difference in its operations. It made possible 8 heats a day where formerly 3 was the average. Despite more than double output, the men are less fatigued now at the end of a day.

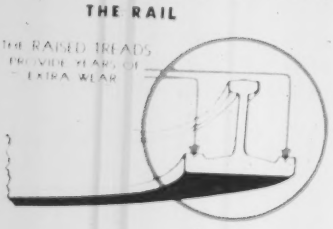
Your CLEVELAND TRAMRAIL *Distributor*

is the Right Man to Know

Cleveland Tramrail distributors are engineering organizations ready to provide counsel on materials handling problems and carry through on all details to erection and operation. Because of their extensive experience you can be sure of getting the best solution to your problem.

There is a nearby Cleveland Tramrail distributor who will be glad to assist you.

ONLY CLEVELAND TRAMRAIL PROVIDES FLEXIBLE SUSPENSION



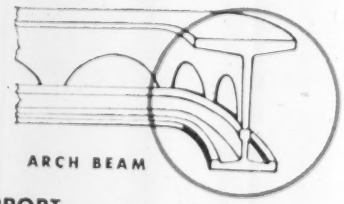
Cleveland Tramrail is the only manufacturer of the full-floating, strain-relieving, flexible-suspension method of track support.

Rail or arch beam is held in position by hanger rods that are attached to the overhead structure. Both ends of the rods have ball and socket connections which provide flexible support and eliminate strains caused by swinging loads.

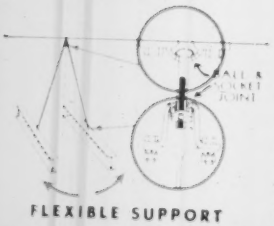
This outstanding feature is a tremendous factor in securing a smooth-running low-maintenance system.

THE RAIL —Tramrail rail is used for loads up to 3 tons where sufficient supports are easily provided.

ARCH BEAM —Seven sizes of arch beam are available for heavier loads or service and where spans between supports are long.



ARCH BEAM



FLEXIBLE SUPPORT

FLEXIBLE SUPPORT —Swinging loads set up high strains in overhead handling systems rigidly secured to the supporting structure and friction is increased and carrier operation retarded by uneven loading of the wheels. This condition is far worse on curves. These disadvantages are eliminated by Cleveland Tramrail flexible ball and socket supports, resulting in unusually smooth, easy operation.

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Over 20 years' practical and technical experience went into the making of today's "Triclene" D. Each year of research brought new improvements as Du Pont chemists kept pace with the changing demands of metal cleaning. And here's the result—a dependable, top-quality solvent that's in step in every way with today's industrial needs.

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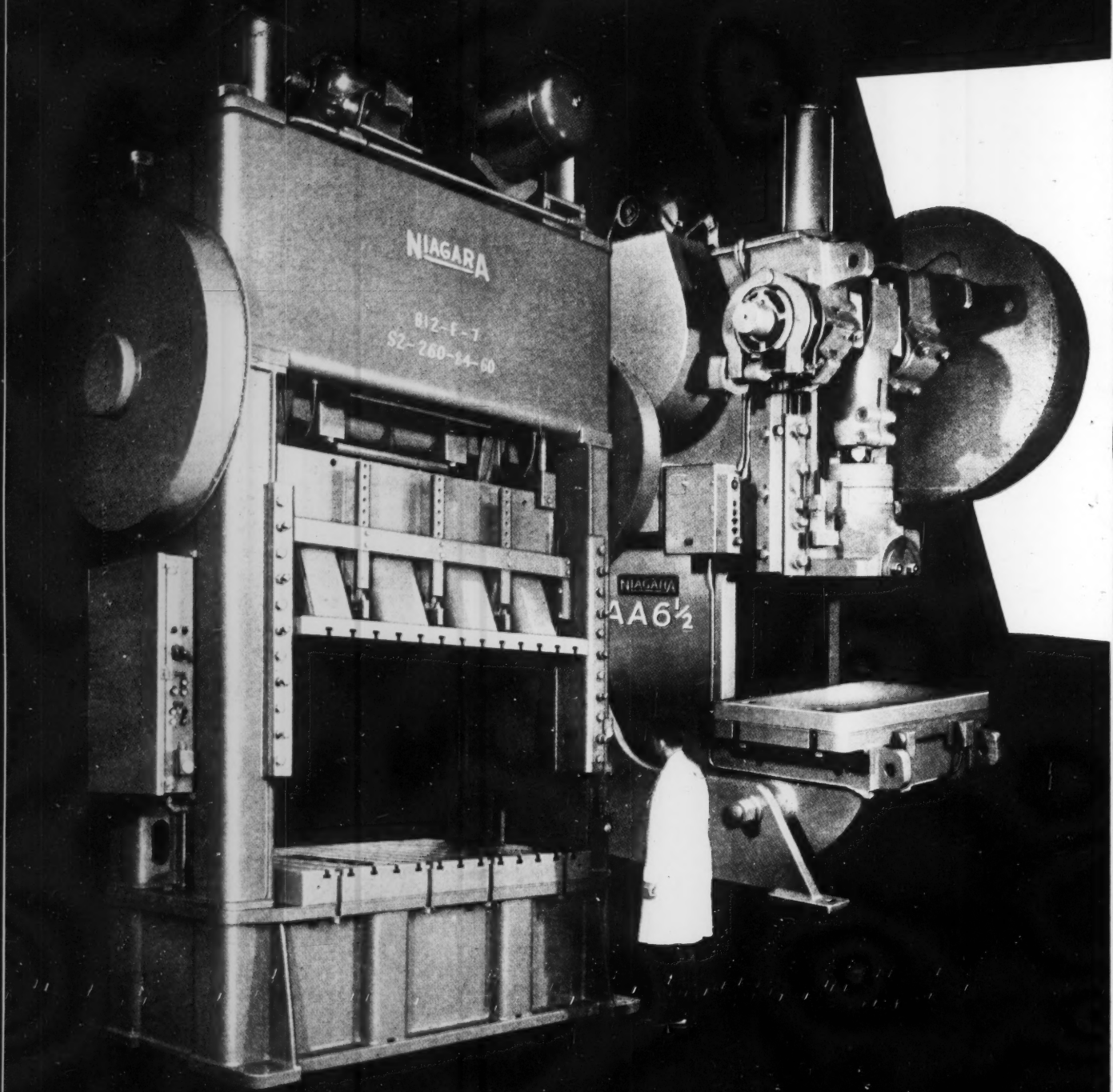

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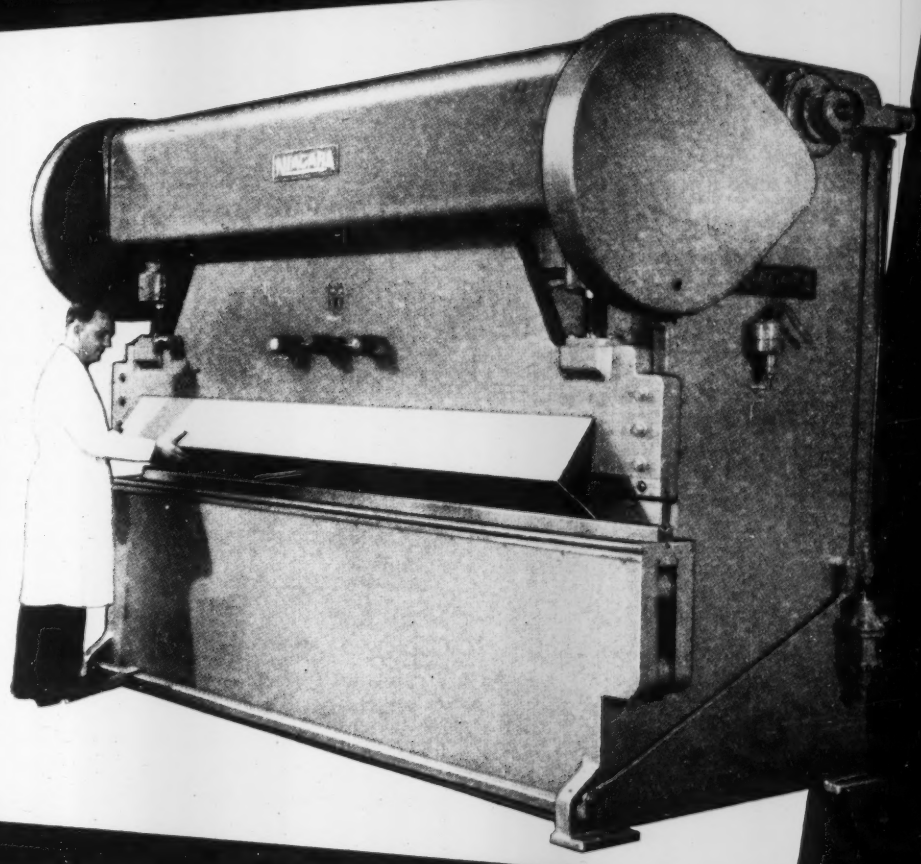

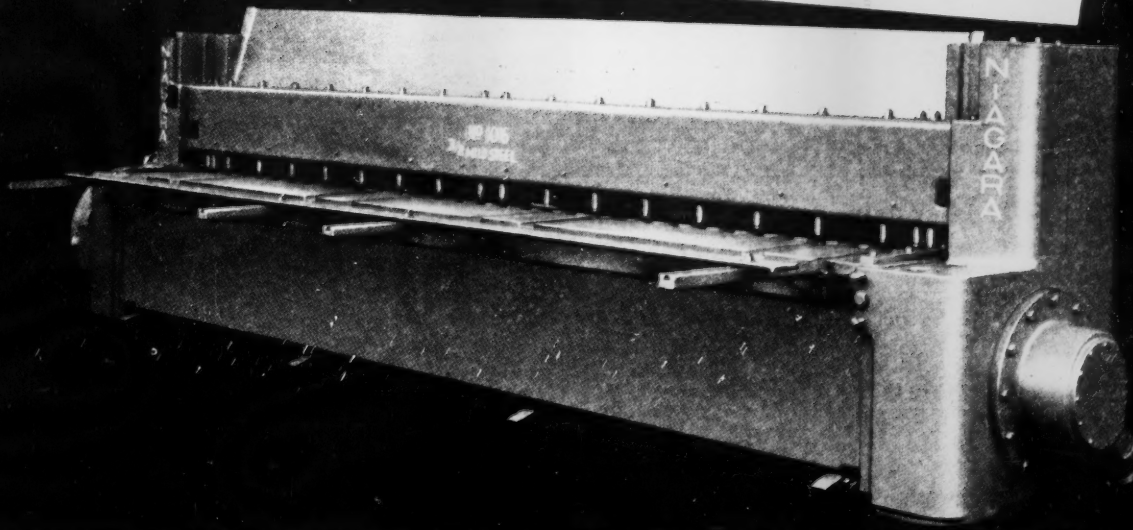

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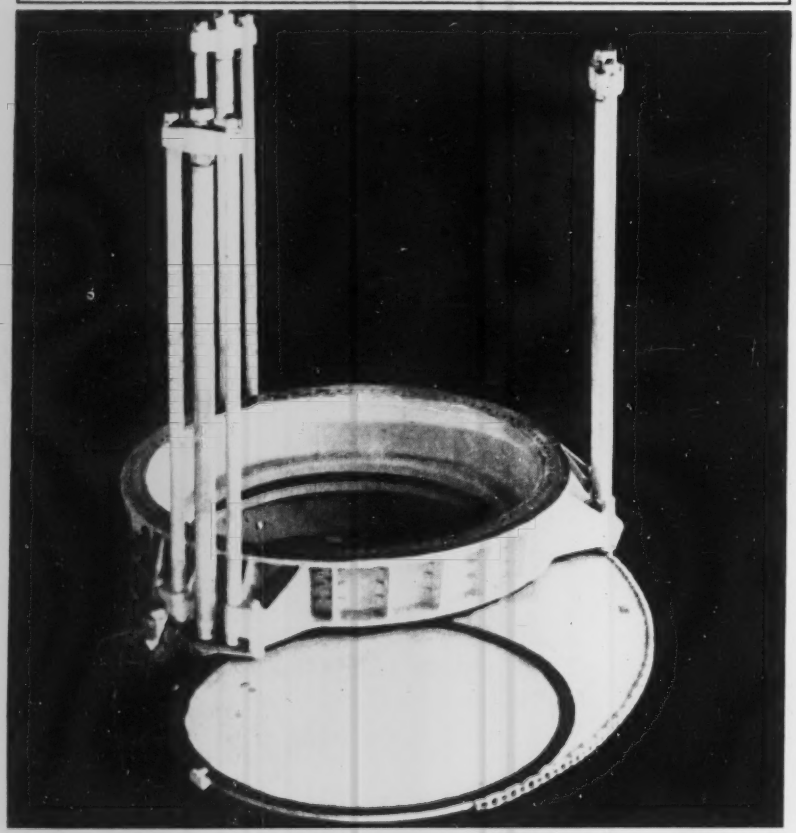
HOW A FORCE OF NATURE IMPROVES STEEL MILL SAFETY

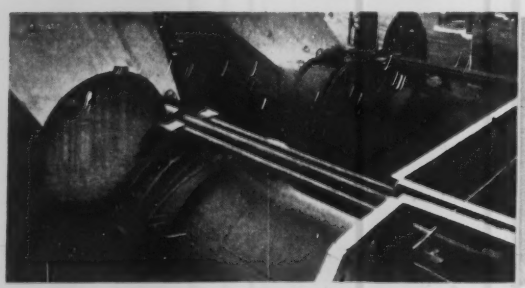


Designed to protect men and equipment, this heavy duty Bailey Valve was produced for one of the nation's major steel makers. Although its diameter is 120" and its weight is close to 42,000 lbs., it is precisely machined to assure a tight, positive gas seal.

AN UNFAILING force of nature the linear expansion and contraction of steel is being used to increase steel mill safety. This powerful force, applied to Bailey Thermal Expansion Goggle Valves, provides a safe, dependable means of positive shutting off large gas mains in emergencies or for repairs.

The Function of Goggle Valves

Ranging in diameter from 36" to 120", this type of valve long has been industry's standard method for controlling gas in the large mains for blast furnaces, gas washers and boilers. They take their name from one of their component parts a large, moveable plate shaped like a pair of aviation goggles. This plate has one "goggle" open, the other of solid steel. When a gas main is in operation, the open goggle allows gas to flow through it freely; when the gas is to be shut off, the plate is moved until the closed goggle blocks the main, forming a tight, leak-proof seal.

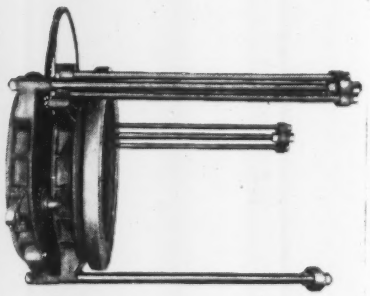


These valves are in service on an Elex Precipitator. In this view the goggle plates are in the open position.

BAILEY THERMAL EXPANSION GOGGLE VALVES

Safety and efficiency in closing the larger sized gas mains are provided by Bailey Thermal Expansion Goggle Valves. In them, the powerful force of linear expansion and contraction of three steel tubes is used to free or clamp the goggle plate providing an absolutely gas-tight seal.

In operation, steam is passed into the tubes, which are spaced evenly around and perpendicular to the rigid steel flanges of the valve. The resulting expansion frees the heavy goggle plate so it may be swung to the open or closed position. When the steam is shut off, contraction of the tubes takes place, closing the flanges tightly against the goggle plate. Since both sides of the plate are machined to conform to the machined edges of the valve flange, Bailey Valves are leak-proof in both open and closed positions.



Bailey Thermal Expansion Goggle Valves are produced in diameters from 36" to 120".

Sound design and precision manufacture are combined in these valves to assure the ultimate in safety and reliability. They have been thoroughly proved on the gas mains of blast furnaces, gas washers and boiler plants. Bailey Thermal Expansion Goggle Valves are completely dependable in hot or cold, dirty or clean gas mains.

WILLIAM M. Bailey COMPANY

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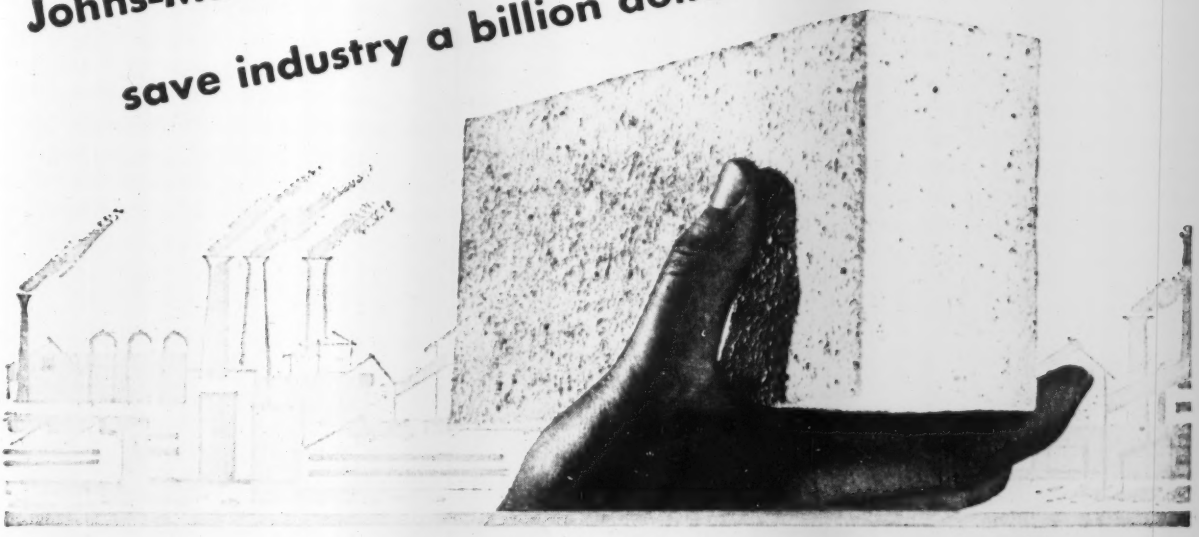
Johns-Manville Insulations save industry a billion dollars in fuel every year!



Reduce your fuel costs and build better furnace linings with JM-3000 INSULATING FIRE BRICK

HERE'S THE ONLY insulating fire brick that withstands a full 3000F. It's highly efficient both as an exposed refractory lining or as back-up insulation. And JM-3000 is only one of six types of Johns-Manville Insulating Fire Brick made for these applications. All provide long-life insulation. All are light in weight, have low conductivity, high structural strength. These properties permit thinner furnace walls—yet you can achieve important fuel savings and increased production, because J-M Insulating Fire Brick assures quick furnace response.

Sil-O-Cel* Insulating Brick is another outstanding J-M fuel-saver . . . a high load-bearing brick for back-up insulation behind refractory linings. It comes in three types, for service through 2500F—makes it possible to reduce the necessary thickness of refractory linings as much as one-third.

Save fuel with J-M Hydraulic Setting Refractories

Johns-Manville refractories meet every need for castable, troweling and gunning applications for temperatures through 3000F. *Firecrete** is used to cast special shapes of all kinds. It is ready for use within 24 hours, has negligible shrinkage and high resistance to spalling. *Blazecrete** is used to build and repair furnace linings. When gunned, it adheres readily with a minimum of rebound loss. When slap-troweled, it eliminates laborious ramming and tamping.

Save Fuel with J-M Aggregates and Fills

These lightweight insulations are used as fills to conserve heat in irregular spaces where other forms of insulations cannot be economically applied. They are also used as aggregates for mixing with other materials to form insulating refractory concrete.

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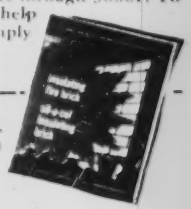
Send for your free copy! This new booklet IN-115A gives full details about J-M insulating materials for service through 3000F. To find out how they can help cut your fuel costs, simply mail coupon.



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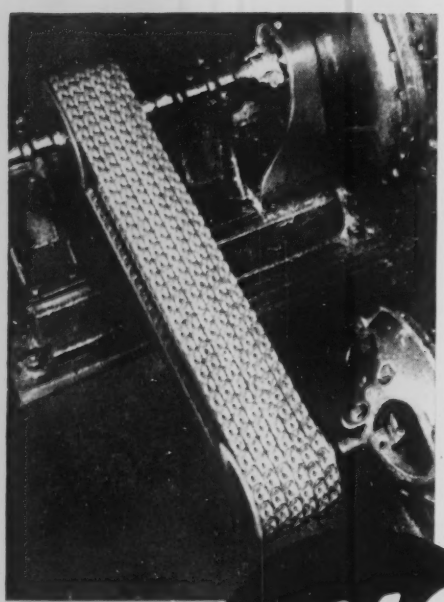
"Yes, but what will it do for me?"



We'll answer your question by giving you a run-down of what we call the three "E's" of Veelos, the adjustable v-belt . . .

Ease of Installation—the link construction of Veelos makes it easy to install without re-setting the motor or tearing down outboard bearings. In many cases installation is completed in 50% to 90% *less time* than it would take to make an endless v-belt installation.

Efficiency of Operation—because individual Veelos v-belts can be adjusted for correct tension, matched sets can be kept matched; vibrationless, full power delivery is assured.

Economy of Inventory—just 4 reels of Veelos in the O, A, B and C widths can replace up to 316 different sizes of endless v-belts. Of course, if your machines use only one or two widths of v-belt, you stock only those widths of Veelos. Inventory is simplified, costly belt deterioration is eliminated and you save valuable stockroom storage space.

Put these three "E's" of Veelos to the test in your plant, under your own operating conditions, and you'll find the answer to your question . . . standardize on Veelos and *save!*

VEELOS
THE LINK
V-BELT

VEELOS DATA BOOK—Here's the complete story on Veelos, the adjustable v-belt. Book gives detailed engineering data, is fully illustrated. Write for your copy today!

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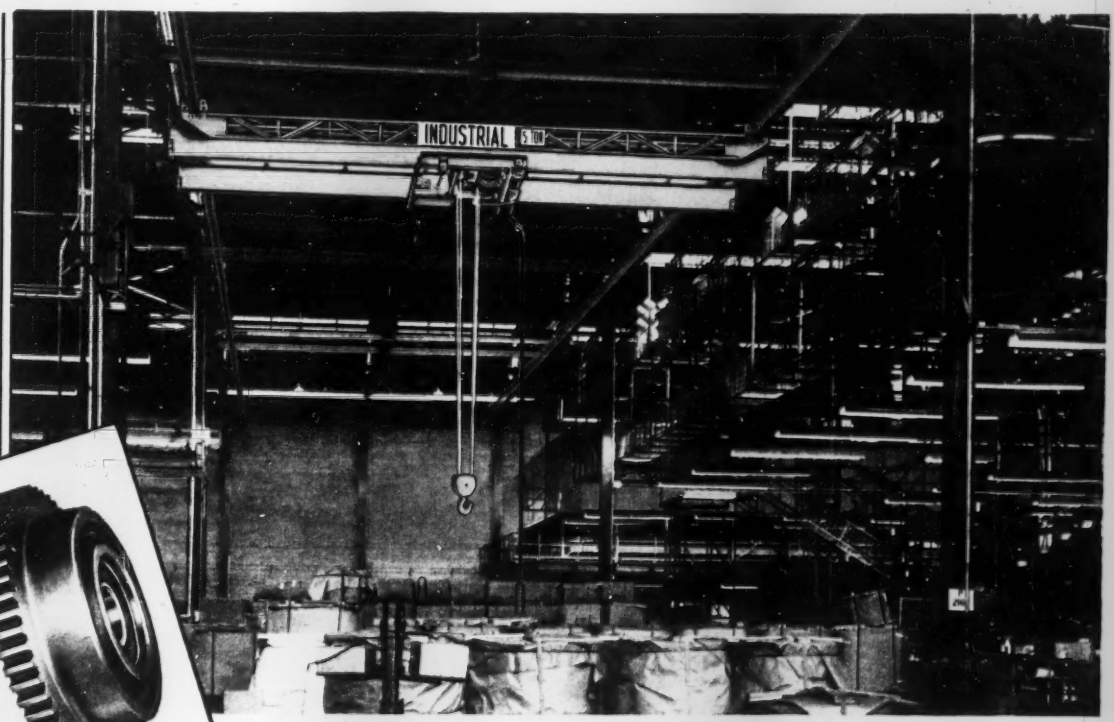
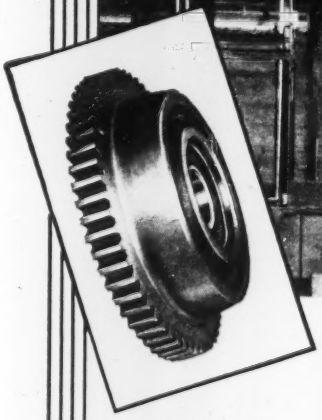
ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Industrial Underhung CRANES

feature Forged Steel Wheels with Hardened Treads





Industrial Truck Wheels are crown tread, single flange, heavy duty wheels, forged and machined from A.I.S.I. Specifications C-1045 steel blanks; the treads of the drive wheels are hardened to a depth of 1/8" at a Rockwell C. 55-60.

Consistent with the company policy of constant improvement in their products, the Industrial Crane & Hoist Corporation provides FORGED STEEL WHEELS with HARDENED TREADS on Industrial Underhung Model Cranes. This improvement combined with other exclusive "Industrial" features will assure longer service life and lower maintenance costs.

Industrial Underhung Cranes are equipped with patented "Industrial" removable head axles, heavy duty ball and roller bearings throughout, roller chain flexible couplings, enclosed gear drive operating in sealed oil bath, and jig-assembled, jig-bored all-welded end trucks.

Industrial all-welded cranes are available in single and double girder types with capacities up to 20 Tons and are the outstanding crane buys in industry today.

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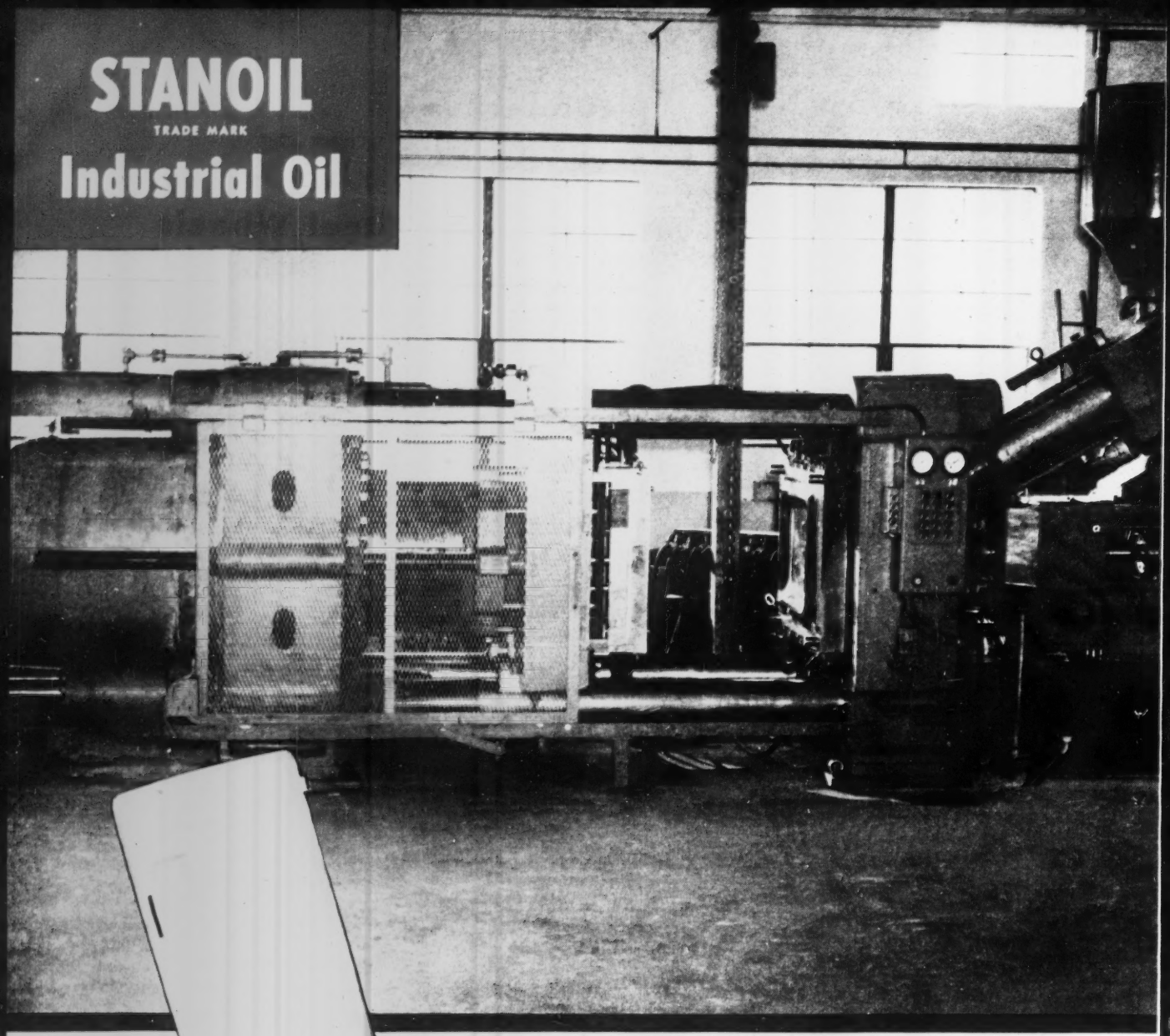
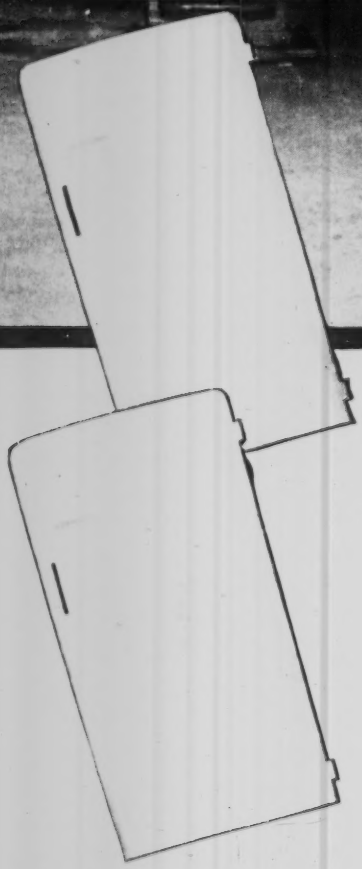




Cutting hydraulic maintenance on...

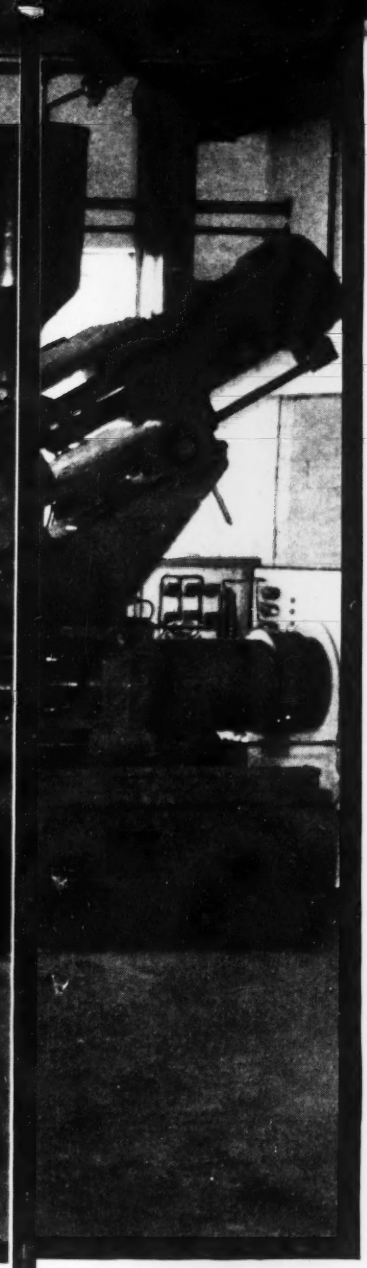
operation big squeeze

• Shown above is one of the world's largest injection molding machines, recently installed by the General Machine Tool and Die Company, Walled Lake, Michigan. The machine has a 1500-ton clamp, a plasticizing capacity of more than 300 pounds of material per hour, and can accommodate molds as large as 4 x 6 ft. in size.

The General Machine Tool and Die Company, a pioneer of the injection molding process of plastic forming, uses the new giant injection machine to produce refrigerator door panels. Forming one entire panel per injection, this Operation "Big Squeeze" pioneers another important advance in injection molding.

In the hydraulic system of this great machine, as in ten other injection presses operated by the General Machine Tool and Die Company, STANOIL Industrial Oil has played a significant role. Withstanding severe conditions of heat and pressure, STANOIL has kept hydraulic systems clean and permitted efficient operation of units at all times. Maintenance has been kept to a minimum.

Find how STANOIL can benefit you by discussing this multi-purpose oil with the Standard Oil lubrication specialist serving your section of the Midwest. Phone your local Standard Oil office. Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

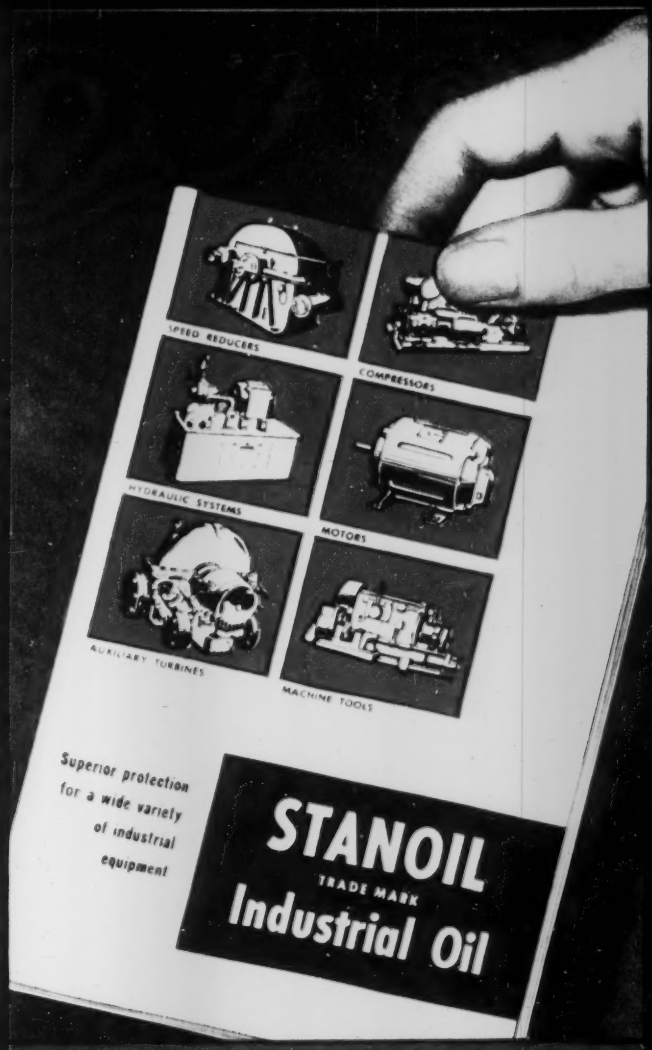


What's YOUR problem?

W. C. Spain, of Standard Oil's Detroit office, has worked closely with the General Machine Tool and Die Company to assure the economical and reliable hydraulic oil performance vital to the operation of this company's injection presses.

Like all Standard Oil lubrication specialists, he has a broad background of practical experience plus thorough training in Standard's own lubrication engineering schools. And like all lubrication specialists, his on-the-job assistance is always available to the industries in the immediate area he serves. He is one of a corps of experienced men who make their headquarters wherever industry is located throughout the Midwest.

For help with your problem, call for the services of your Standard Oil lubrication specialist. Phone your local Standard Oil office.



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STANDARD OIL COMPANY
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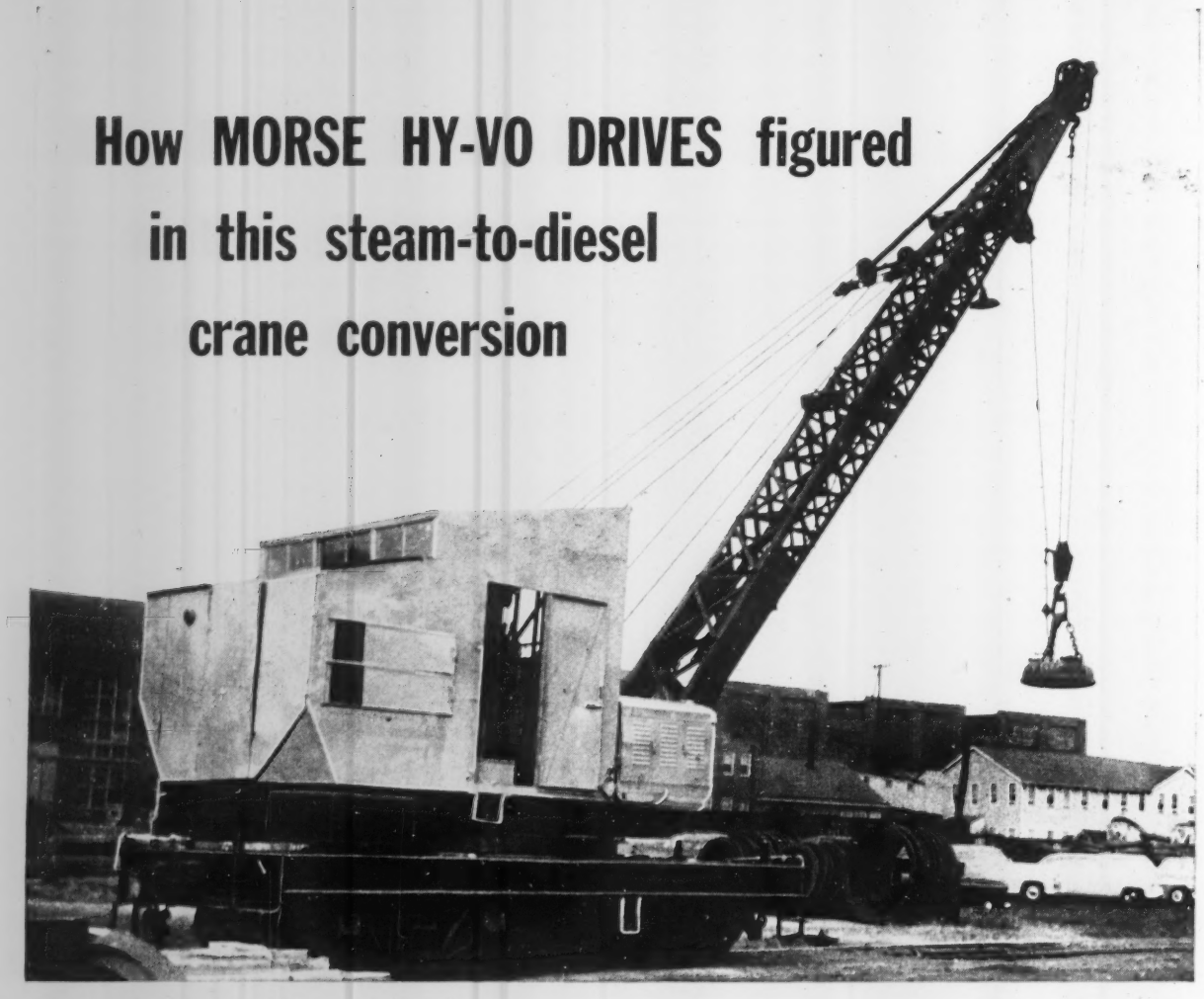
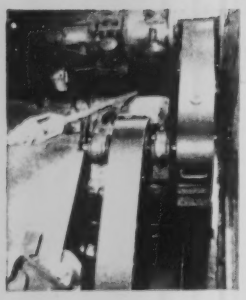
You'll find the means to significant savings in this booklet. It describes the important qualities of STANOIL Industrial Oil and the resultant benefits which have made this multi-purpose oil the choice of midwest manufacturers for a host of lubricating jobs. Discover how STANOIL will give you superior protection through its unique combination of six outstanding characteristics, including high stability and effective rust prevention. Find how STANOIL can simplify stock, storage, and inventory in your plant by replacing special-purpose oils in a wide variety of equipment. Ask the Standard lubrication specialist from your nearby Standard Oil office for this booklet, or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

How MORSE HY-VO DRIVES figured in this steam-to-diesel crane conversion





Inset shows encased Morse Hy-Vo Drives. Note narrowness of drives in relation to 165 hp. power-transmission requirements.

After thirty-four years as a steamer, this Browning locomotive crane owned by Edgewater Steel Company was converted to diesel power.

Its new power equipment: A Cummings 165 hp. engine with a torque converter drives a 1" x 4" Morse Hy-Vo Drive, connecting converter output shaft to jackshaft, second reduction is made with a 1" x 5" Morse Hy-Vo Drive.

Results: Smoother, more positive control, more reserve power. Operating cost per year cut from $11,232.00 to $7,887.36, a savings of $3,344.64.

Morse Hy-Vo is especially suited to steady or intermittent transmission of heavy loads in cramped space.

In fact, Hy-Vo can transmit up to 5000 hp., run at linear velocities of 6500 fpm. and speeds of 3600 rpm. At the same time, it gives up to one-third longer service life, reduces operating and maintenance costs as much as 50%; runs coolly, quietly, smoothly with less than 1% friction loss. In most instances, it does away with bulky outboard bearings.

With just these few facts in mind, *think* of the advantages in design and function opened to you by Morse Hy-Vo Drive. Write us for details on Hy-Vo in your applications, or let us send you Hy-Vo Catalog C72-51. Morse Chain Company, Dept. 560, 7601 Central Avenue, Detroit 10, Michigan.

M=PT

MORSE *means* POWER TRANSMISSION

and EXCEPTIONAL ENGINEERING SERVICE

and EXCEPTIONAL PRODUCT LIFE

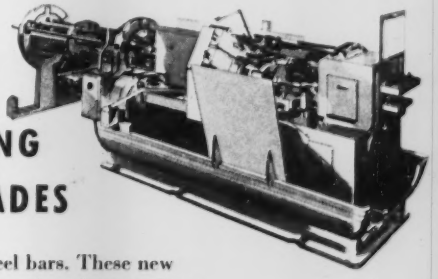
and EXCEPTIONAL PRODUCT QUALITY

MORSE

MECHANICAL *POWER TRANSMISSION* PRODUCTS

NEW LEADED ALLOY STEEL BARS

MACHINE 1/3 FASTER!



AVAILABLE IN .20 CARBON CARBURIZING AND .40 CARBON HEAT TREATING GRADES

Now you can get both Leaded 8620 and Leaded 4140 cold-finished steel bars. These new leaded alloy bars retain the properties of comparable non-leaded grades—but they machine one-third faster!

Over the past ten years, 8620 has proved to be the most popular alloy carburizing steel for most applications. Now, with lead, its metallurgical qualities are retained and machinability is greatly improved.

Since the middle thirties, 4140 has been a very popular oil quenching steel. Again, the addition of lead does not change the heat treating practice, but does improve machinability.

The heat-treating characteristics, hardenability, and mechanical properties of these bars are not appreciably affected by the addition of lead. The sole purpose of adding lead is to improve the steel's machinability. Order a trial lot and see what these steels can do on your machines.

La Salle STEEL CO.

Manufacturers of the Most Complete Line of Cold-Finished Carbon and Alloy Steel Bars in America

Send for **Helpful Data Bulletin No. 13 on Leaded Alloys**

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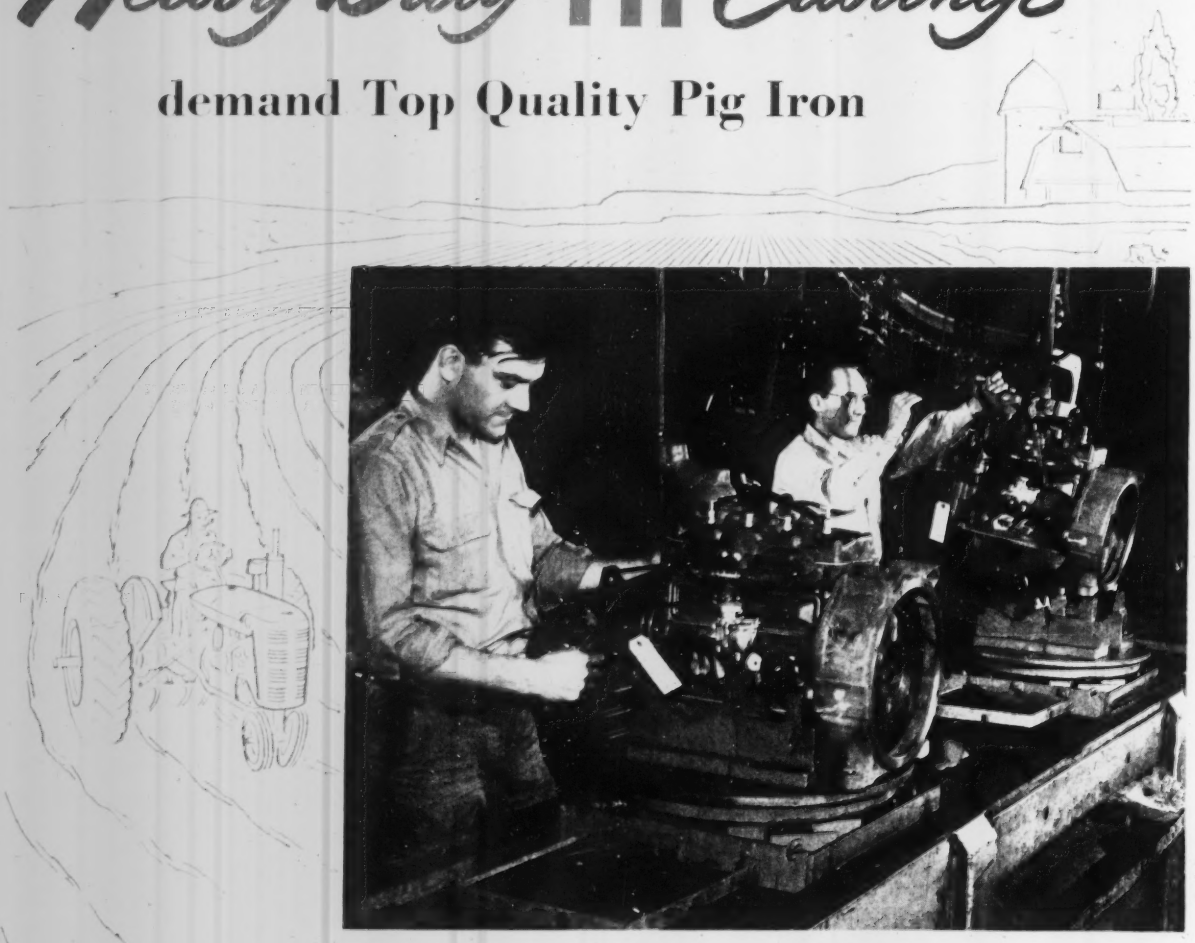
Heavy Duty IH *Castings*

demand Top Quality Pig Iron



TRACTOR engines have to be tough to withstand the constant heavy duty service that's part of everyday farm use. That's why the International Harvester Company sets rigid quality specifications on the pig iron they use for tractor engine castings and other important cast parts. For many years International Harvester has relied upon the uniform composition and high quality of Neville Pig Iron. ● If you have a problem of maintaining special properties in your castings, chances are we can help you, too. Why not call or write us *today?*

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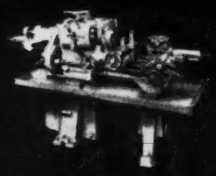
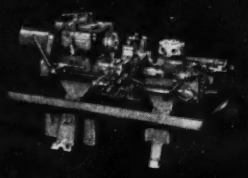
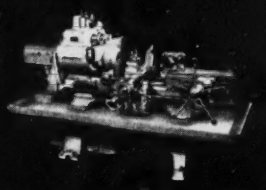


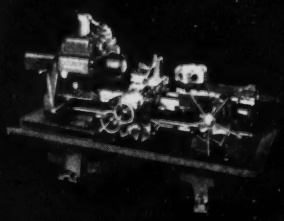
NO. 2 ALL-GEARED HEAD
1" Bar Capacity—14" Swing



NO. 3 UNIVERSAL
1½" Bar Capacity—15⅜" Swing

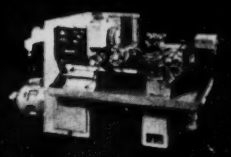


NO. 4 UNIVERSAL
2" Bar Capacity—18⅛" Swing



NO. 5 UNIVERSAL
2½" Bar Capacity—20" Swing

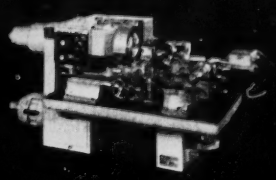
NO. 1 ELECTRO-CYCLE
⅜" Bar Capacity—11" Swing



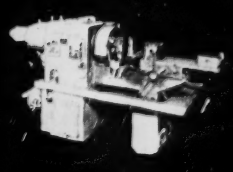
NO. 2 ELECTRO-CYCLE
1" Bar Capacity—14" Swing

WARNER & SWASEY TURRET LATHES

● THERE is a proper size Warner & Swasey Turret Lathe to fill your turning needs, for it has always been a cornerstone of Warner & Swasey design to build an individual model for each range of work.

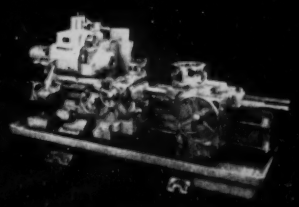


NO. 3 ELECTRO-CYCLE
1½" Bar Capacity—15⅜" Swing

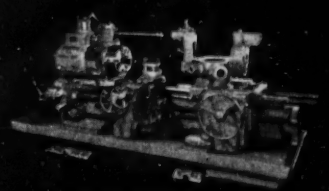


16" ELECTRO-CYCLE
1½" Bar Capacity—16⅞" Swing

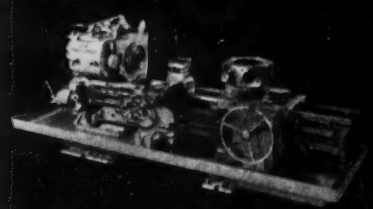
SADDLE TYPE



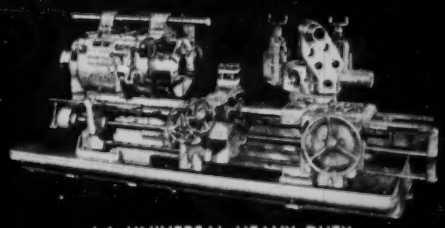
1-A UNIVERSAL HEAVY DUTY
2½" or 3" Bar Capacity—16¼" Swing



2-A UNIVERSAL HEAVY DUTY
3½" Bar Capacity—20" Swing



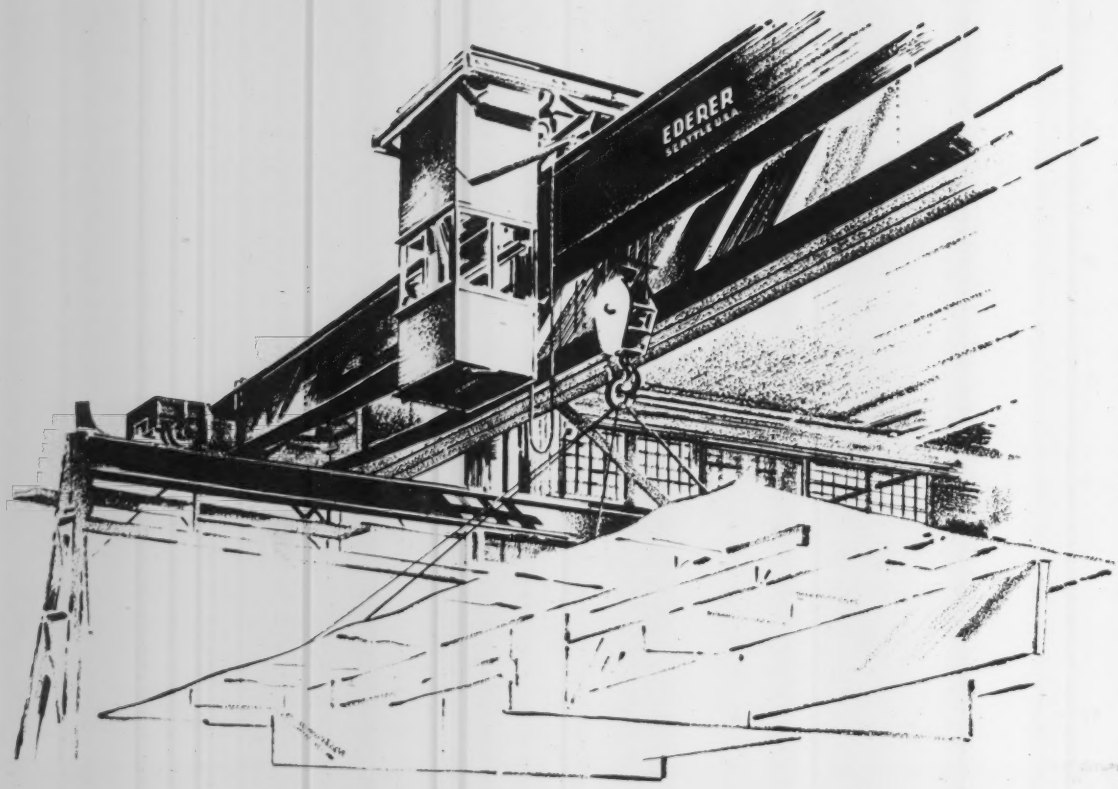
3-A UNIVERSAL HEAVY DUTY
4½" or 6" Bar Capacity—23½" Swing



4-A UNIVERSAL HEAVY DUTY
8", 9" or 12" Bar Capacity—28¼" Swing

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS, TAPPING MACHINES



Weldment-handling expediter at work!

This 15-ton, 80-foot EDERER crane was "job-engineered" to expedite the handling of heavy fabricated steel plate sections. The cab moves with the trolley, keeping the operator constantly "on top" of his load. EDERER'S heavy-duty construction — a basic plus in all EDERER "job-engineering" — gives you oversize parts throughout — plenty of safety margin where extra strength is needed — operating speeds of greatest efficiency. This makes for the most in performance — the least in maintenance — lower cost-per-ton materials handling.

Whatever *your* industry, you have *your* particular materials handling requirements. Whether for plant expansion or new construction, EDERER — one of the largest crane manufacturers in the West — can "job-engineer" a crane to meet them.

Write for Crane Bulletin CR-500

250C53

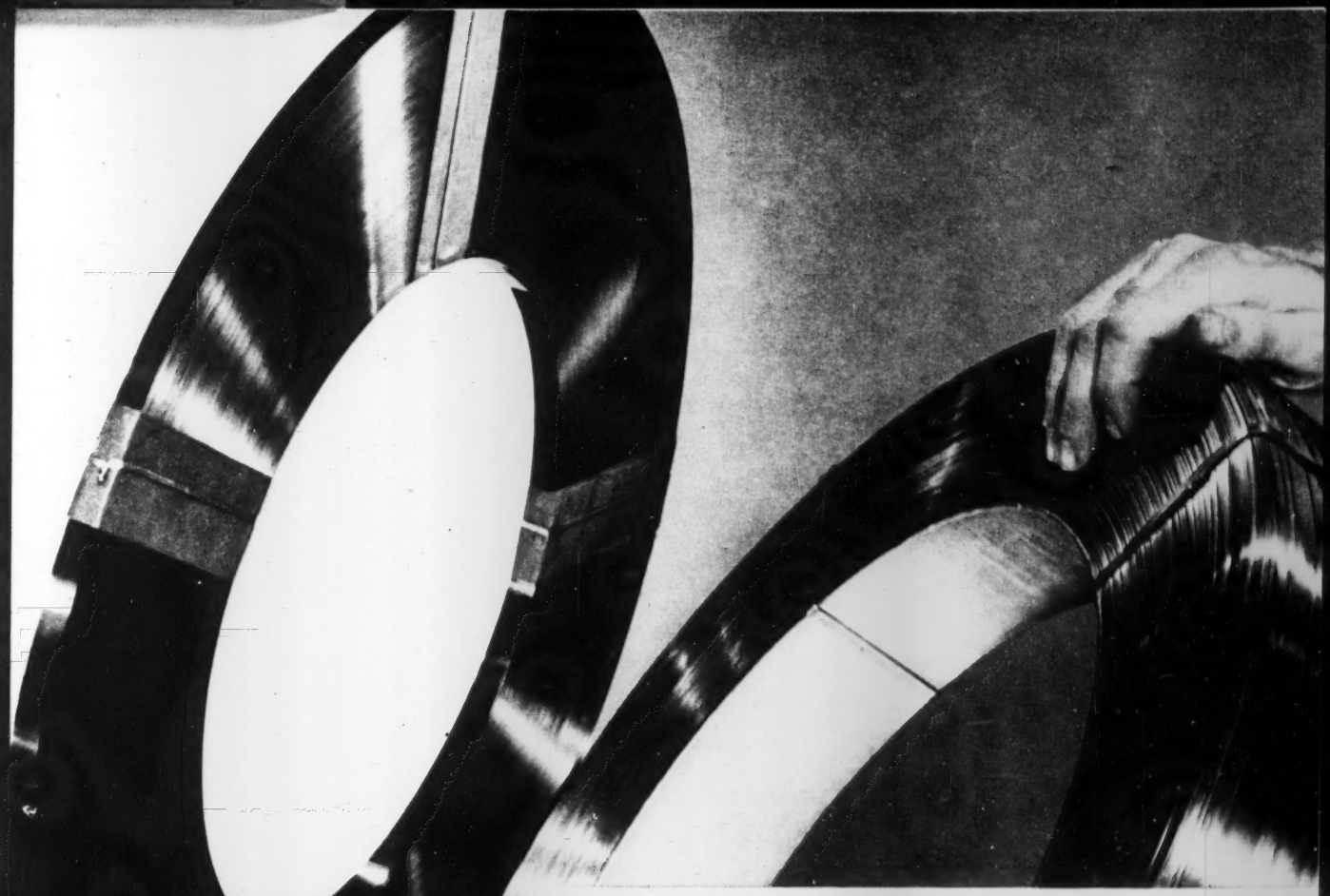
EDERER ENGINEERING COMPANY 2935 First Ave. So. • Seattle 4, Wash.

Export Division: 301 Clay St., San Francisco 11, Calif.

OVER 50 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY

EDERER

CRANES



S.S. United States//.. most modern, fastest liner afloat.

Nothing finer!

A statement from
a conservative organization:

"Our records show that when a manufacturer once discovers the uniform quality of Roebling flat spring steel, he becomes a steady Roebling customer."

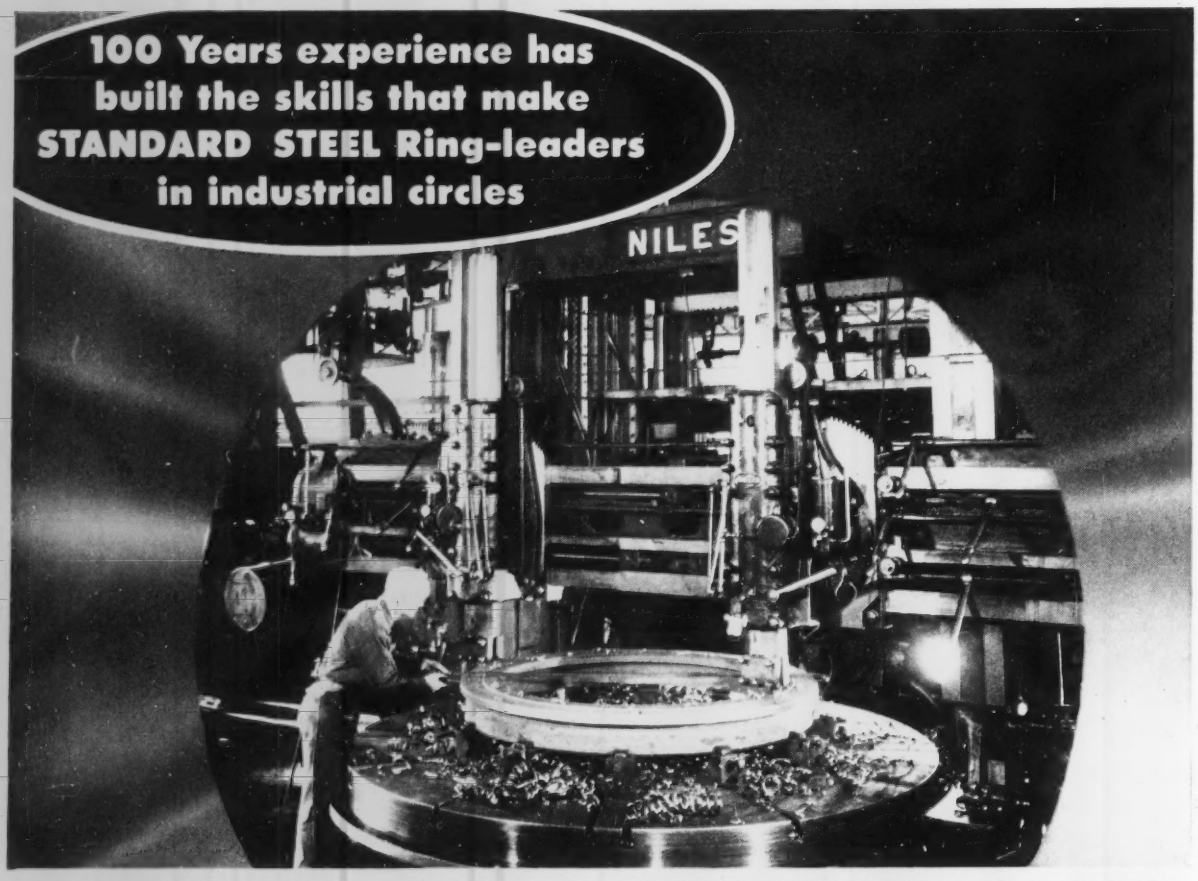
You, too, *pay* for the best spring steel... make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 55 SLEEPER ST. • CHICAGO, 4525 W. ROOSEVELT RD. • CINCINNATI, 3253 EREDONIA AVE. • CLEVELAND, 19225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 165 FISHER BLDG. • HOUSTON, 5215 NAVIGATION BLVD. • LOS ANGELES, 5340 E. RANDOLPH ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

100 Years experience has built the skills that make STANDARD STEEL Ring-leaders in industrial circles



Photographed through one of the smallest forged rings made by Standard Steel, this 120-inch Niles vertical boring mill is machining a gun base mount stand ring which will have a finish O.D. of $69\frac{1}{2}$ inches, which operator is checking.

Experience builds skill, and skilled manufacturing produces quality products. Standard Steel Works has had 100 years of experience to build the manufacturing skills that produce finest quality weldless rings and flanges.

Standard Steel's experience has developed to a high degree the skills that make possible accurate quality control of the analysis and physical properties of their steels . . . close control of heat treatment, rolling and other forming operations . . . precise machining to assure finishing of rings and flanges to exact specifications.

You can't ignore experience as a guide to quality, and Standard Steel's experience is hard to match . . . still another reason why you can always rely on Standard Steel for rings and flanges.

ONE OF SIX REASONS why you should call Standard Steel for forgings and castings.

1 Experience—produced by skilled workmen with 20 to 40 years experience.

2 Quality Steel—through production of own steel by acid process.

3 Uniformity—assured by precise control of forging and rolling operations.

4 Fast Service—a vital factor in the continuing growth of Standard Steel for over 150 years.

5 Testing—radiographic tests, tensile tests, hardness tests, ultrasonic probing of internal structure, etc.

6 Capacity—unsurpassed ability to produce forgings and castings of unusual sizes and shapes, such as weldless rings all the way up to 144" O.D.

For more information, write Dept. 8546

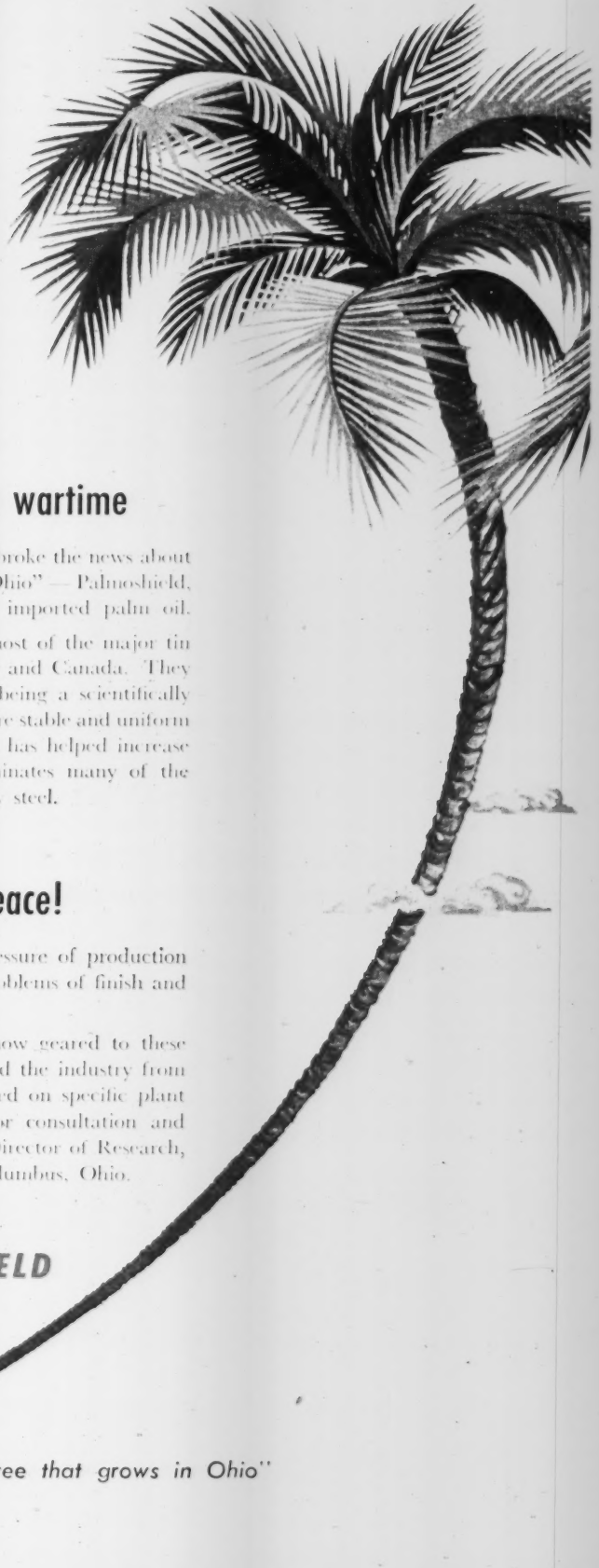
Standard Steel Works Division

BURNHAM, PENNSYLVANIA

BALDWIN · BLH · LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON

General Offices: Philadelphia 42, Pa. • Offices in Principal Cities



We "planted" it in wartime

Two years ago next month we broke the news about "the palm tree that grows in Ohio" — Palmoshield, the domestic replacement for imported palm oil.

Users at this writing include most of the major tin plate producers of this country and Canada. They have found that Palmoshield, being a scientifically formulated product, is much more stable and uniform than the natural oil. In use it has helped increase tonnage as much as 15%. More important, it eliminates many of the variables which can prevent rolling clean, high quality steel.

...it flourishes in peace!

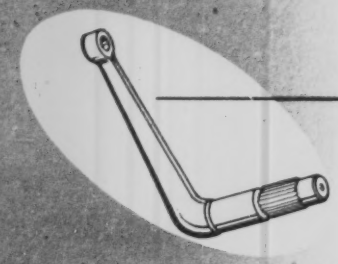
Today, the picture in steel is changing. With the pressure of production easing, increasing emphasis is placed on quality, on problems of finish and efficiency in operation.

Ironsides research, which developed Palmoshield, is now geared to these problems of the future. The same facilities which freed the industry from dependence upon foreign lubricants can now be focused on specific plant lubricating questions. Our engineers are available for consultation and technical assistance without obligation. Call or write Director of Research, The Ironsides Company, 270 West Mound Street, Columbus, Ohio.

Special Lubricants and Preservatives

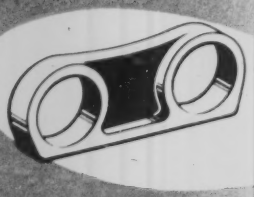
SHIELD PRODUCTS **IRONSIDES PALMOSHIELD**

"the palm tree that grows in Ohio"



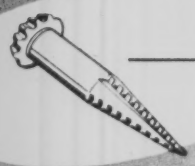
DETROIT BROACH TOOLS STEERING ARMS

Production costs took a sharp turn downward when Detroit Broach tooling started producing the spline on tractor steering arms. Teeth are produced in one machine cycle with simple tooling on an economical punch press.



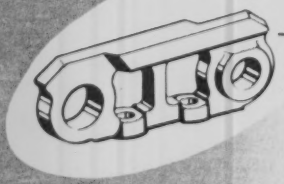
DETROIT BROACH TOOLS END PLATES

Accuracy climbed and costs slipped when Detroit Broach tooling finished the holes in track end plates. Two holes are machined at once, with accuracy well within specified production tolerances.



DETROIT BROACH TOOLS COTTON PICKER SPINDLES

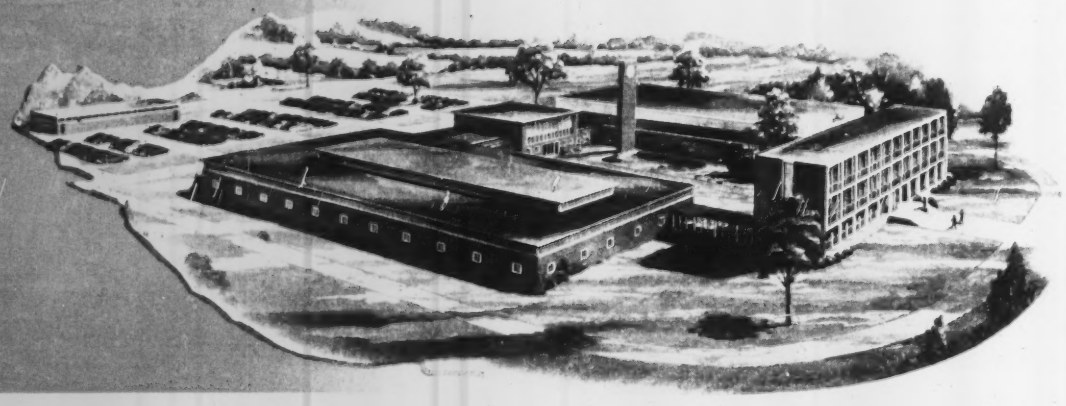
Consistent top notch quality is easy pickin' since Detroit Broach tooling started putting the "bite" on these spindles. Tooth spacing, size, and shape on each flute are consistently identical with important production economies, too.

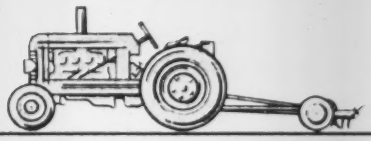


DETROIT BROACH TOOLS SIDE BARS

Broaching the holes in track side bars is another operation with better accuracy and lower costs since Detroit Broach tooling took over. Size, spacing, concentricity and squareness are within tolerance limits while achieving steady, high-output production quotas.

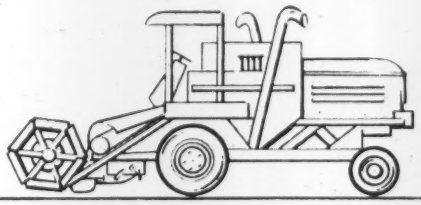
This is a view of the new, ultra-modern Detroit Broach plant and offices located in Rochester, Michigan—just outside Detroit. Designed by Sture Frolen, eminent Swedish architect, it embodies many important advancements that contribute to employee morale and manufacturing efficiency. Another example of the unusual facilities of Detroit Broach Company.





Broaching Pioneers

IN THE FARM EQUIPMENT INDUSTRY



Dependable, work-saving agricultural equipment, at a price practical for the majority of farmers, has accounted for the rapid growth of mechanized farming in the past twenty years.

And one of the important means which equipment manufacturers use to cultivate more production at lower cost is broach tooling from Detroit Broach. A few typical parts which Detroit Broach has tooled for agriculture are shown at the left.

in YOUR industry, too,

there are countless examples of Detroit Broach tooling that is helping to lower the boom on production costs. At the same time, it is tooling which consistently reaps a bumper crop of benefits in terms of closer tolerances with repetitive accuracy, good surface finishes, and low tool maintenance costs.

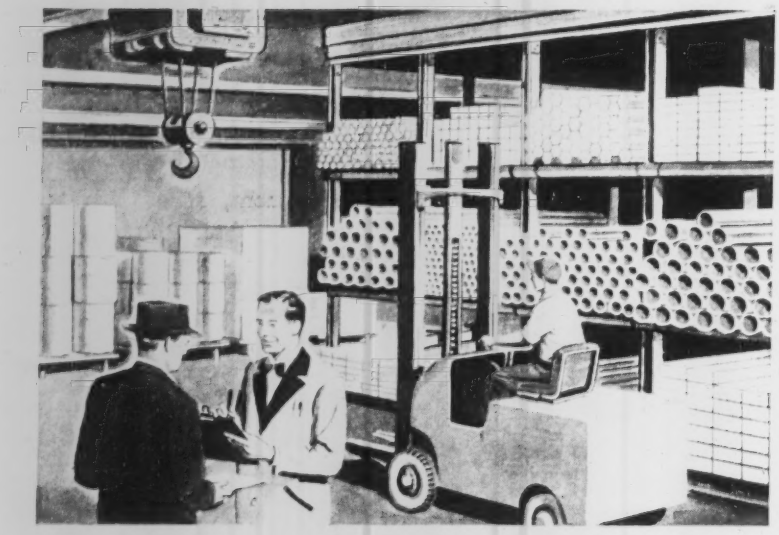
Chances are that Detroit Broach tooling can do the same for you! You can find out by simply contacting your local Detroit Broach representative or by dropping a line to the home office. There's no better time than right now to do it.

Detroit Broach COMPANY

ROCHESTER, MICHIGAN

OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

Get "Department Store Service" From Your Reynolds Aluminum Distributor



Here's what happens when you "shop" at your Reynolds Aluminum Distributor's "Industrial Department Store."

First, you eliminate inventory problems. Your Reynolds distributor carries a complete line of aluminum mill products in all standard alloys and tempers.

Second, you profit from your Reynolds Distributor's prompt delivery service. This speedy, dependable service helps keep your regular production on schedule . . . helps meet emergency needs on your special "rush" orders.

Third, you gain by getting help on your production problems. Your nearby Reynolds Distributor will make it a point to know your problems and to help you solve them. And back of him is Reynolds fully integrated staff of technical service men.

Call your Reynolds Distributor today . . .
he's as near as your phone . . . he's a good man to know.

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

REYNOLDS DISTRIBUTORS

ALABAMA
Arnold-Brown Metals & Supply Co., Birmingham
Southern States Iron Roofing Co., Birmingham

CALIFORNIA
Braico Metals, Inc., Los Angeles
Clingan & Fortier, Inc., Fresno, San Francisco and Vernon (Ingot also)
Tay-Holbrook, Inc., San Francisco
Union Hardware & Metal Co., Los Angeles
United States Steel Supply Div., Los Angeles

COLORADO
Marsh Steel Corporation, Colorado Springs and Denver
Salt Lake Hardware Co., Grand Junction

CONNECTICUT
American Steel & Alloys Corp., Hartford

DISTRICT OF COLUMBIA
Lyon, Conklin & Co., Inc., Washington

FLORIDA
Horne-Wilson, Inc., Jacksonville, Miami, Orlando and Tampa
Southern States Iron Roofing Co., Jacksonville, Miami, Orlando and Tampa

GEORGIA
Southern States Iron Roofing Co., Albany, Atlanta, Augusta and Savannah

IDAHO
Salt Lake Hardware Co., Boise

ILLINOIS
Aluminum Distributors Inc., Chicago
J. G. Braun Co., (Architectural only) Chicago
Sipi Metals Corp., (Ingot only) Chicago
United States Steel Supply Div., Chicago
Benjamin Wolff & Co., Chicago

INDIANA
Hubbell Metals Inc., Indianapolis

KENTUCKY
Southern States Iron Roofing Co., Louisville

LOUISIANA
Southern States Iron Roofing Co., New Orleans

MARYLAND
Clendenin Bros., Inc., Baltimore
Lyon, Conklin & Co., Inc., Baltimore

MASSACHUSETTS
Bay State Refining Co., (Ingot only) Chicopee Falls
Arthur C. Harvey Company, Boston

MICHIGAN
Kasle Steel Corporation, Detroit
McDonnell Bros., Inc., (Architectural only) Detroit
Meier Brass & Copper Co., (Wire, rod, bar, structurals) Detroit
Milton A. Meier Co., (Ingot only) Detroit and Grand Rapids

MINNESOTA
United States Steel Supply Div., St. Paul
Vincent Brass & Copper Co., Minneapolis

MISSOURI
Hubbell Metals Inc., North Kansas City and St. Louis
Marsh Steel Corporation, North Kansas City

NEW JERSEY
Barth Smelting Corp., (Ingot only) Newark
Edgcomb Steel Corporation, Hillside
Mapes & Sprowl Steel Co., Union

NEW YORK
Barth Smelting Corp., (Ingot only) Newark, N. J.
J. G. Braun Co., (Architectural only) New York
Edgcomb Steel Corporation, Hillside, N. J.
Mapes & Sprowl Steel Co., Union, N. J.
Ontario Metal Supply, Inc., Rochester

NORTH CAROLINA
Southern States Iron Roofing Co., Raleigh

OHIO
The Atlas Metal Co., (Ingot only) Cleveland
The G. A. Avril Company, (Ingot only) Cincinnati
Kasle Steel Corporation, Cleveland
Mutual Manufacturing & Supply Co., Cincinnati
Vorys Brothers, Inc., Columbus

OREGON
Woodbury & Company, Coos Bay, Eugene, Medford and Portland

PENNSYLVANIA
Athos Steel Service Co., Philadelphia
Levinson Steel Sales Company, Pittsburgh
Merchant & Evans Co., Philadelphia
Pennsylvania Industrial Supplies Co., Inc., Pittsburgh
Potts-Farrington Company, Philadelphia
Nathan Trotter & Co., Inc., (Ingot only) Philadelphia

SOUTH CAROLINA
Southern States Iron Roofing Co., Columbia

TENNESSEE
Southern States Iron Roofing Co., Memphis and Nashville

TEXAS
Moncrief-Lenoir Mfg. Co., Dallas, Harlingen, Houston, Lubbock, San Antonio and Temple
Vinson Supply Co., Dallas, Odessa and Snyder

UTAH
Salt Lake Hardware Co., Salt Lake City

VIRGINIA
Southern States Iron Roofing Co., Richmond

WASHINGTON
Clingan & Fortier, Inc., Seattle

WISCONSIN
Benjamin Wolff & Co., Milwaukee

Look Under "Aluminum" in Your Classified Telephone Directory

Here's the NEWEST ADDITION to Worthington's welding positioner line

It's the new, heavy-duty precision welding positioner with the 7 features you've always wanted in one unit

1. PRECISION GEAR AND PINION DRIVE for accurate adjustment and minimum backlash. Self-locking worm reducer provides safety factor in case of power failure. All gears are machine-cut.

2. SPECIALLY-DESIGNED VARIABLE SPEED DRIVE provides stepless speed change from zero to predetermined top speed.

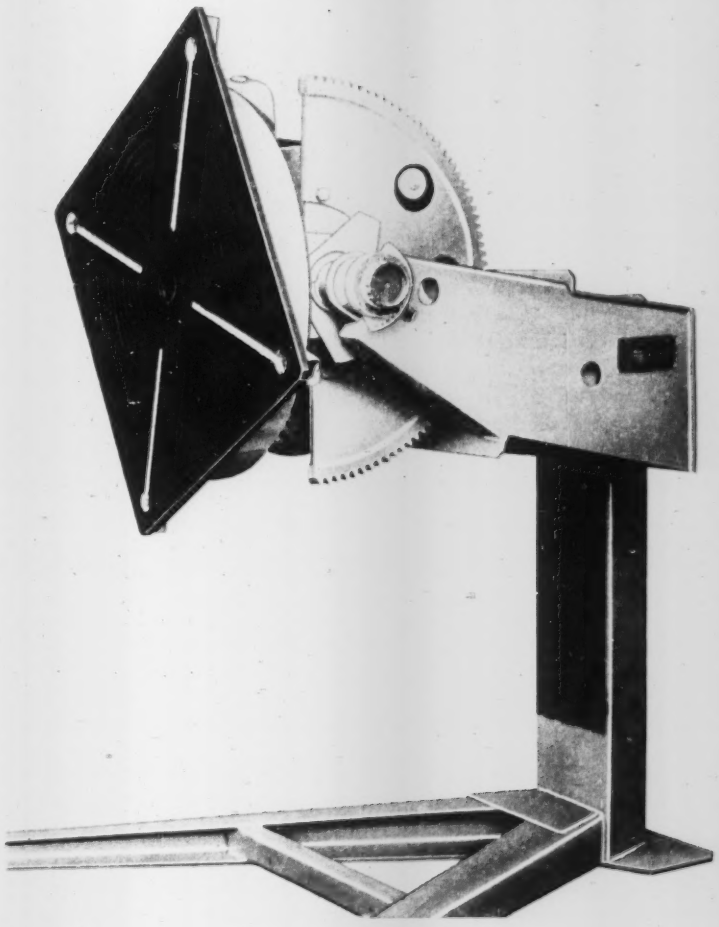
3. FAST-MOVING TILT TABLE with tilt indicator for accurate location of work at the best welding angle.

4. BUILT-IN HIGH-CAPACITY GROUND giving resistance-free return of welding current results in more uniform welds.

5. SPHERICAL SELF-ALIGNING YOKE BEARINGS eliminate misalignment.

6. HEAVY-DUTY FABRICATED STEEL POST, machined on front surface for easier raising and lowering of positioner. Positioner can be mounted on your column or wall by removing standard post.

7. MAGNETIC REVERSING STARTERS and push button controls provide for both rotation and tilt drives.



See these at the National Metal Exposition, 2111 Upper Exhibition Hall, Cleveland Public Auditorium, Cleveland, Ohio.

Y 3 4

The new Worthington positioners come in 2500, 3000, and 6000 lb. capacity sizes. Get more facts by sending the coupon to Worthington Corporation, Section Y.3.4, Plainfield, New Jersey.

WORTHINGTON

WORTHINGTON CORPORATION

Section Y.3.4 **Plainfield, New Jersey**

I'd like to know more about your new welding positioner.

☐ Please send me one of your bulletins.

☐ Have one of your sales engineers call on me.

NAME .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE STATE

LORAIN CRANES

handle 10,000,000 lbs. of metal per month in this yard

3 Lorain Cranes are on the go sixteen hours a day, the year 'round at this large midwestern manufacturing plant. They report their Lorains (2 on rubber tires, shown below) handle more than 10,000,000 lbs. of raw and processed stock to feed production lines on schedule. Moves are many — and the rubber-tire cranes scoot all over the roadways of the large storage yard, sorting, selecting and lifting all types of materials from numerous stockpiles, loading and transporting them to factory, as well as performing extra-duty jobs that save time, equipment and money. The Lorains are fitted with magnets and slings to handle a wide variety of material sizes and shapes. The check-list at right is typical of the many ways Lorains save time and money at this plant.

Want to save money in *your* plant, too? Then, check the Lorain Self-Propelled Crane story! See how rubber-tire mobility, choice of many lifting attachments, one-man control, long, far-reaching booms . . . plus Lorain quality features and full-line selection on crawler or rubber-tire mountings, from 6 to 45 tons capacity will enable you to do more, faster, better, at lower cost with a Lorain. Get that story *now* from your local Thew-Lorain Distributor.

LORAINS DO THESE JOBS —BETTER AND FASTER— *at this plant!*

X	Handle Raw Stock
X	Handle Semi-Finished Stock
X	Handle Scrap
X	Push and Tow Railroad Cars
X	Dump Tote Boxes
X	Lift 10 to 12-ton Loads
X	Travel up to 2 miles per day

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

20-TON
Lorain Self-Propelled Crane equipped with 24" x 36" rectangular magnet.

10-TON
Lorain Self-Propelled Crane with 36" diameter magnet. Their 3rd Lorain is crawler mounted.

IT CAN'T HAPPEN HERE !

Weirzin

ELECTROLYTIC ZINC-COATED STRIP

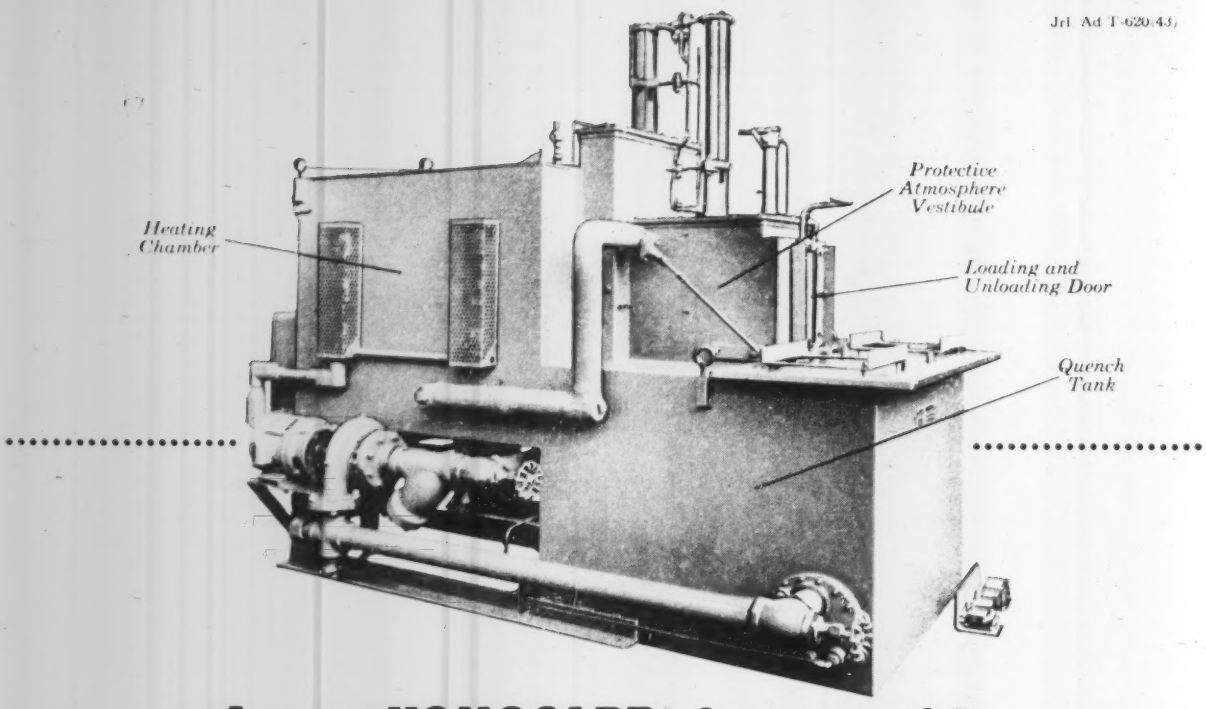
Is Permanently Protected Against Underfilm Corrosion

Weirzin steel strip is protected for life against costly underfilm corrosion. The tight, malleable zinc-coating actually becomes a part of the steel and remains intact even under extreme conditions of temperature and humidity. Further protection against corrosion is offered in Weirzin treated with Bonderite—and is recommended for any parts subject to atmospheric corrosion, or for enameled, lacquered or painted parts. Exhaustive tests have proved that the added protection that Bonderite offers is worth double its cost. Also of great interest is the fact that fabrication of Weirzin does not weaken the protective coating. After deep drawing, forming and punching, the zinc-coating remains unruptured and evenly deposited. You can be sure that your product is protected when you use Weirzin. Send for a sample today—make your own tests—see how your product can be made better . . . with Weirzin.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



A new HOMOCARB® furnace with protected quench

Now, for the first time, work can be direct-quenched from a Homocarb furnace under a protective atmosphere.

This new horizontal Homocarb combines the well known benefits of the Homocarb method . . . continuous, automatic control of time, temperature and atmosphere . . . with a protected quench. Work moves directly from the furnace to the quench under a protective atmosphere . . . without exposure to air.

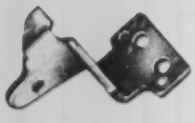
Heat treaters, metallurgists and production men will quickly recognize that this new L&N Homocarb furnace—complete with Microcarb® atmosphere control—marks a significant step forward.

The complete equipment consists of:

1. *The new horizontal Homocarb furnace with protected quench*
2. *Microcarb atmosphere control*
3. *D.A.T. three-function temperature control*

For complete information just write us at 4957 Stenton Avenue, Phila. 44, Penna.

LEEDS NORTHRUP
instruments automatic controls • furnaces



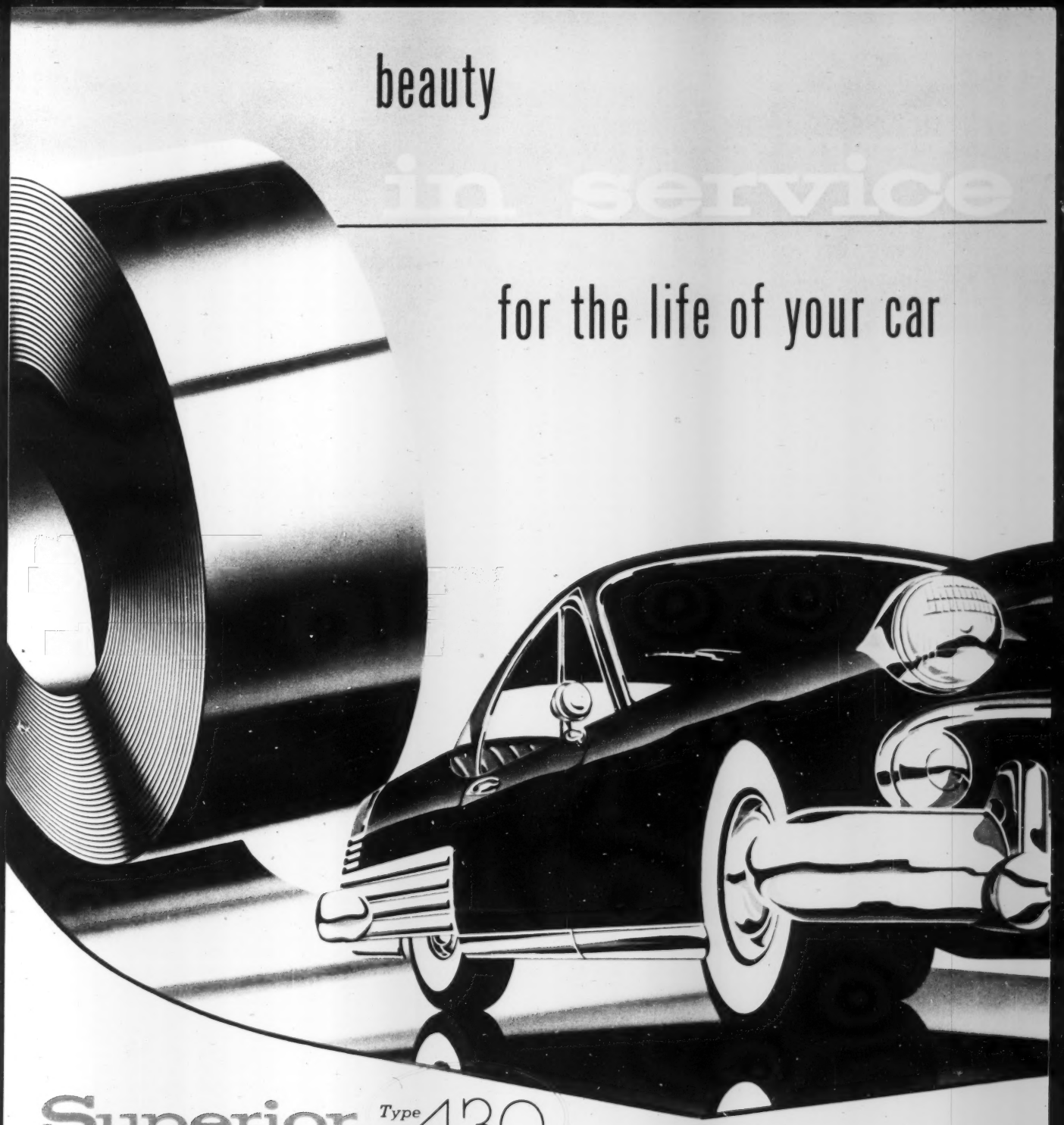
Now IBM uses 1010 instead of 1065

At the IBM plant in Poughkeepsie, N.Y. they refer to their protected quench Homocarb as a "problem-solver". For example, the brackets shown ½ size, formerly made of 1065 steel to meet physical requirements, presented severe forming problems. Now IBM forms these parts of 1010 steel. They are then carburized in the Homocarb furnace at 1700 F to a surface carbon content of 0.65% and direct-quenched under protective atmosphere. Physical specifications are well within specified tolerances, and cost of forming has been sharply reduced.

beauty

in service

for the life of your car

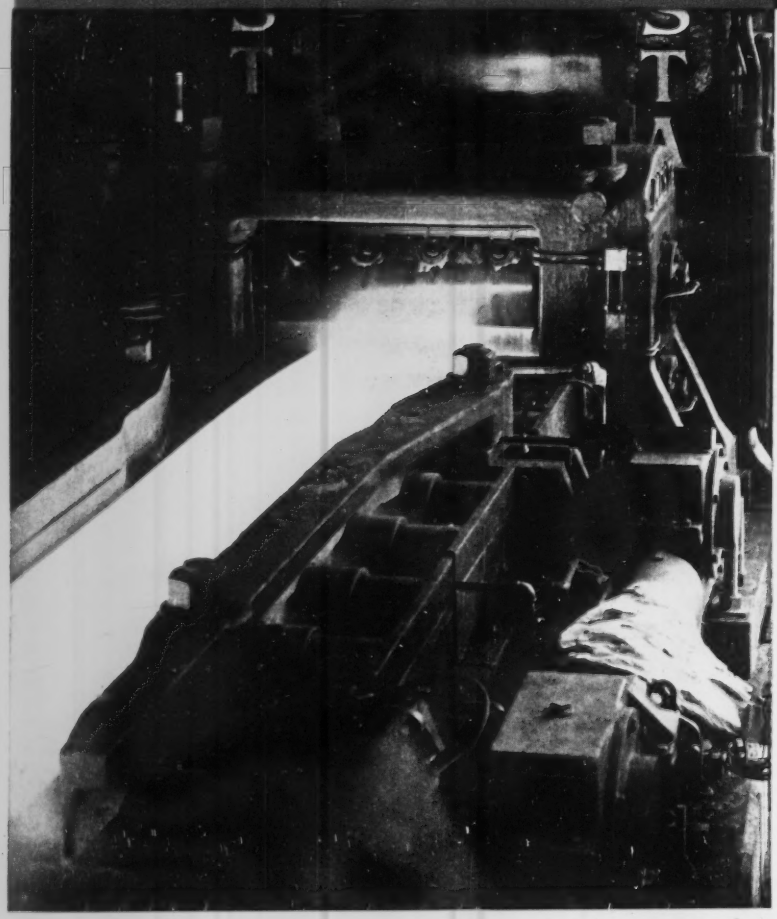


Superior Stainless Type 430 strip steel

SUPERIOR STAINLESS STEEL cuts down care on the modern car. Where exposure's greatest, Superior Stainless serves the brightest . . . defying rust, peeling, rubs and scrapes because it's *solid* clear through. • Foremost automotive fabricators choose Superior Type 430 Stainless Steel for every workable reason. *Let us serve your requirements.*

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

SAVE A MILL A POUND... EARN AN EXTRA $2 A TON



A saving of only a mill per pound on the cost of rolling steel, adds up to an extra profit of $2.00 per ton. One way you can make this saving is to see that your equipment runs without unnecessary interruptions or slowdowns. And here Texaco can help you greatly.

First of all, Texaco has *a complete line* of steel mill lubricants . . . designed to assure you smooth, uninterrupted operation . . . longer life for all your machinery and equipment . . . lower maintenance costs.

Then there is Texaco Lubrication Engineering Service rendered by men trained and experienced in steel mill operations . . . men qualified to help you in many cost-saving ways beyond the mere recommendation of lubricants.

Let us show you how you'll benefit by teaming up with Texaco. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants, Fuels and Lubrication Engineering Service

STEEL
November 30, 1953

Metalworking Outlook

Defense Needs Steady

"Defense requirements for steel will remain about the same in the first half of 1954 as they are now," says Defense Secretary Charles E. Wilson. We must not make sudden and radical changes in that part of our economy which we devote to defense, he believes. This quarter, about 1.8 million tons of steel, 217.5 million pounds of copper and 203.6 million pounds of aluminum are going to direct defense and atomic energy uses. The allotments are down a little for the next quarter. Government planners are considering modifying the Defense Materials System to cut down on paperwork, but DMS will not be scrapped. The simplified system could become effective Jan. 1.

Gone to Pot?

In the past 13 years of easy selling, "the auto industry's marketing skills have gone to pot." So says Packard Motor Car Co. President James J. Nance. He thinks the situation can be remedied and that the industry will be able to produce and sell 5 million cars next year, compared with some 6 million this year.

Needed: Flexible Labor Contracts

Watch for a trend next year, spurred by management, for more flexible labor contracts. Executives want provisions that will permit smooth solution of problems like this: When Briggs Mfg. Co. is taken over by Chrysler Corp., the 30,000 Briggs employees say they want pooling seniority with the nearly 100,000 Chrysler people in the Detroit area; the Chrysler workers hint they'll fight the proposal, and thus far no satisfactory plan has been worked out. Another labor headache results from the sale of Willow Run by Kaiser Motors Corp. to General Motors Corp. What happens to the pension funds accumulated for former Kaiser employees?

Loans Are Liberal

Take a good look at the Small Business Administration's revised loan policy. It's surprisingly liberal. Aside from a few categories of business which under law are not eligible for loans, any small business enterprise with a good management record and able to give reasonable assurance of repayment is eligible to apply for a loan. SBA plans no preference between types of business in considering applications.

500,000 More

Besides loans, there are other indications that the Republican administration has a fatherly eye on small business. For one thing, it wants more children of that type. Today, about 3.6 million small companies are operating. The U. S. wants to encourage the establishment of some 500,000 more.

In the Works: Titanium Plan

In the works is a program to salvage titanium scrap. The Air Force has already requested that the airframe users of the metal inventory their

The Technical Outlook—p. 97 The Market Outlook—p. 149

scrap, and the Office of Defense Mobilization is considering a request from titanium producers and fabricators that it act on the matter.

All Except Excises

The House Ways & Means Committee staff and the Treasury department are in agreement on about practically all 1954 tax proposals that will be submitted to Congress except the excise issue. In both camps there's strong support for a manufacturers' tax of 5 per cent to supplant the present excise system, but that proposal is a hot political potato. Agreed upon is this: To let the excess profits tax end and personal income taxes drop 10 per cent on Jan. 1; to continue the 52 per cent normal tax on corporate earnings instead of allowing a reduction to 47 per cent that's presently scheduled for April; and to liberalize depreciation rules.

Trouble in Tariffs

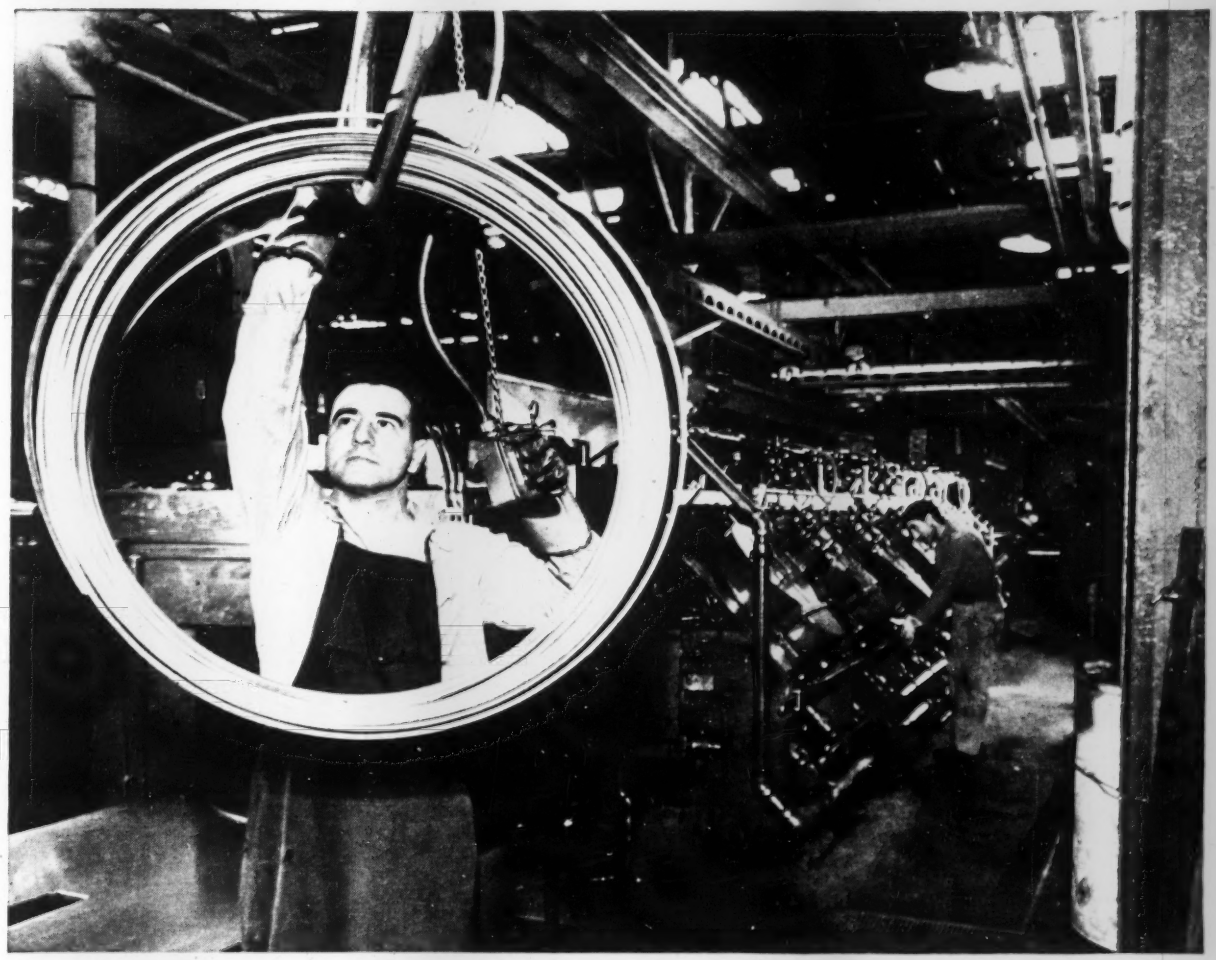
Harbinger of next year's bitter struggle over the tariff issue is the action of the National Association of Manufacturers' directors in announcing that NAM has no policy on tariffs. The action followed resignation of Monsanto Chemical Co. from the group in protest over speeches by NAM President Charles R. Sligh Jr. to the effect that he favored gradual reduction in import barriers. Because the situation is so delicate, don't expect President Eisenhower to make any specific tariff recommendations until after he receives the report of the Randall Commission on Foreign Trade, due next year.

Straws in the Wind

U. S. Steel Corp.'s U. S. Steel Products Division will soon start construction of a plant at Pensauken, N. J., to be completed early in 1955 for the manufacture of drums and pails. . . Republic Steel Corp. has begun construction of a $2.2-million East Toledo, O., plant to be completed next summer for the production of iron powder. . . George C. McConnaughey, an attorney and former utility executive, has been named member and chairman of the Renegotiation Board. . . Small Business Administration is protesting to the U. S. comptroller general at what SBA considers harsh treatment of companies in collecting claims. . . Despite a general decline in the order backlog of the machine tool industry, New Britain Machine Co. says it has a higher volume of business on hand now than a year ago, partly because of more civilian orders.

This Week in Metalworking

Republic Steel Corp. will start a new pricing system Dec. 15 (p. 55). . . Steel warehouse business will be good in 1954, but off a little from 1953 levels (p. 56). . . Although balking at some questions, steel companies are co-operating with the United Steelworkers of America—CIO in answering its 17-page questionnaire on insurance and pensions (p. 57). . . Philanthropic contributions are becoming big business for business (p. 58). . . Defense department has set up policies to govern the spending of $850 million it has available for equipment and facilities to build up the mobilization base (p. 61).



In Connecticut, a new idea.

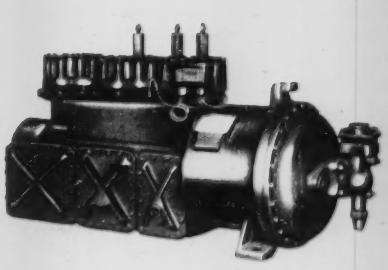
CHILLED COOLANT

BOOSTS BRASS OUTPUT

Here's an unusual application: a stock Westinghouse air conditioning compressor which speeds up rod production. First of its kind in the brass industry.

At Scovill Mfg. Co., they roll ¾" rod down to ¼", using special 12-stand mills running 24 hours a day. Our Connecticut distributor, J. P. Salmini Co., helped them improve this process. By pumping chilled coolant over the rod before it enters the rolls, they get these profit-making benefits: 1) increased output; 2) life of rolls tripled; 3) a better and more uniform finish; and 4) cleaner working conditions due to reduced oil smoke.

If your problem is product cooling—or process or comfort air conditioning of any kind—we can help you. Experienced Westinghouse distributors like J. P. Salmini Co. are located across the nation. Let one of them increase your profits with new ideas. He's listed under Air Conditioning in your classified telephone book. Westinghouse Air Conditioning Division, Hyde Park 36, Mass.



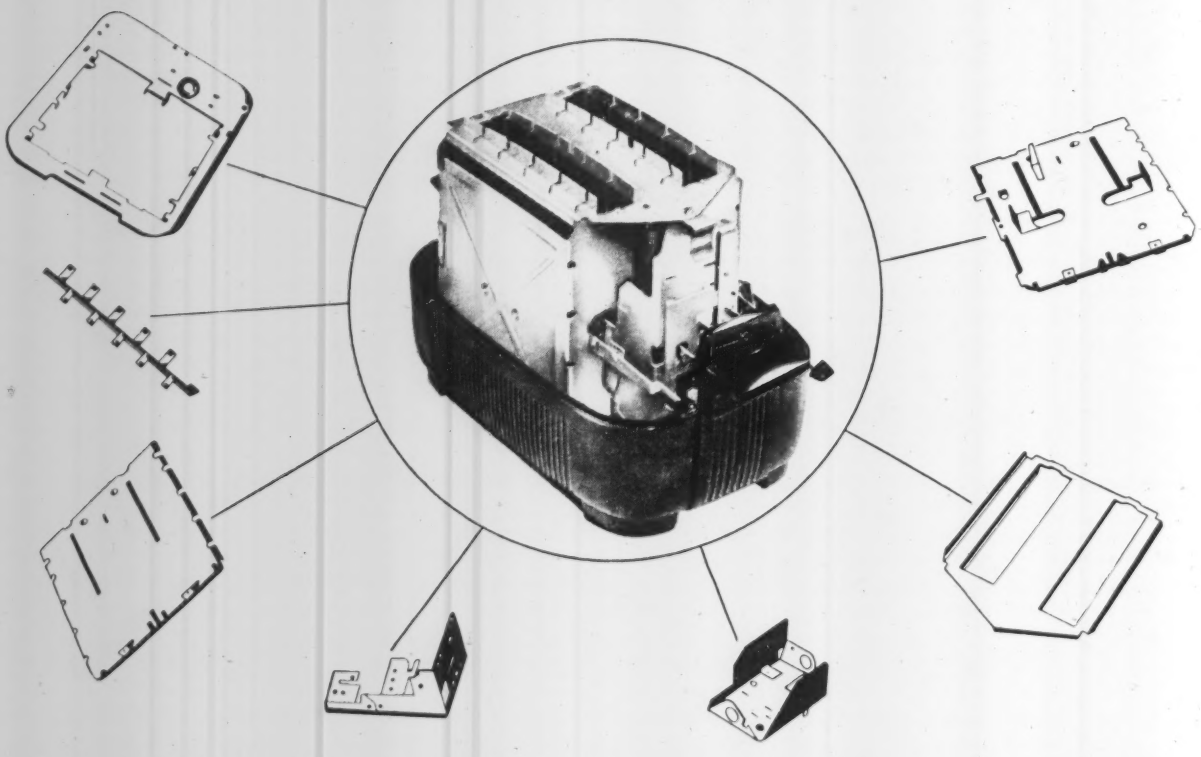
This is the compact, lightweight compressor which not only makes these production savings possible, but adds its own savings: less maintenance, longer life, peak efficiency and low operating cost. The hermetically-sealed design is the reason. No belts, pulleys, or shaft seals. It cools itself with the refrigerant it pumps!

WESTINGHOUSE AIR CONDITIONING

YOU CAN BE SURE... IF IT'S **Westinghouse**

Saves $100,000 a Year

by specifying this Special Armco Steel



A few years ago a leading manufacturer changed from a plated metal to Armco ALUMINIZED Steel for several parts of an electric toaster.

THE CHANGE-OVER SAVES $100,000 A YEAR. This saving is in plating costs alone. Because it is a hot-dip aluminum coated steel, Armco ALUMINIZED needs no plating. Interior parts of the toaster are simply stamped out and installed without any additional operations.

HIGHLY EFFICIENT, TOO

Besides cutting costs, parts made of Armco ALUMINIZED Steel assure top efficiency. The inside stays hot, the outside cool. The reason is that Armco ALUMINIZED is an excellent *heat reflector* up to about 900 F. It reflects more than 80 per cent of the radiant heat thrown against it.

At higher temperatures, Armco ALUMINIZED is a good *emitter* of radiant heat. From 900 F to about 1250 F the aluminum coating alloys permanently with the steel base. It forms a tight gray surface layer of iron-aluminum alloy. This also gives the steel an unusually good refractory coating.

If you make products that are exposed to a combination of heat and corrosion, there's a good chance that Armco ALUMINIZED Steel can help you cut costs and turn out a better product.

It may pay you to look into the advantages of this Armco Special-Purpose Steel. Just fill in and mail the coupon on this page for complete information.

ARMCO STEEL CORPORATION

4963 Curtis Street, Middletown, Ohio • Export: The Armco International Corporation

ARMCO STEEL CORPORATION
4963 Curtis Street, Middletown, Ohio

SEND ME INFORMATION . . .

I would like full information on Armco ALUMINIZED Steel sheets and coils. We manufacture

NAME _____

TITLE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ ZONE _____ STATE _____

Too Much Smog

Presence last week of great masses of penetrating fog, smoke, smog or smaze in several areas in the United States and in England again emphasizes the fact that air pollution is an extremely dangerous menace and that in many localities progress in combating it is inexcusably slow. Unless more aggressive measures are taken to solve this problem, there is a grave danger that a series of major disasters may occur and that rightly or wrongly a substantial portion of the blame will be placed squarely upon the shoulders of industry.

Already we have had enough experience to know that these clouds of polluted air, which seem to recur with constantly increasing frequency, are costly beyond measure. If one were to ask a clipping service to provide newspaper clippings of every article dealing with the complaints of residents for damage inflicted by smoke, fumes and other industrial wastes, the evidence would be astounding.

The death toll is even more alarming. In England a few days of heavy fog combined with soft coal smoke results in the loss of several thousand lives. In the United States we still number the deaths caused by a day or two of smog in a metropolitan area at one or two score. However, this toll is mounting and we still are painfully ignorant as to many details that should be known about the ingredients of smog, smaze, etc.

The present danger clearly calls for more intelligent action by many more persons than in the past. Fortunately, in a few localities where air pollution was especially bad and where its adverse effects were particularly noticeable, public protests have forced remedial measures, some of which are proving very effective. The experience gained in these areas where real progress is being made is extremely valuable. It should be made easily available to the areas where authorities have been slow to meet the challenge of the air pollution problem.

If your plant emits smoke or any other industrial waste, ask yourself whether or not you are doing all you should do to help solve the community problem of air pollution. It's vitally important!

E. L. Shaner

EDITOR-IN-CHIEF

SIMPLIFIES PRICING: On Dec. 15 Republic Steel Corp. will place into effect a new pricing system for hot-rolled carbon steel bars (p. 55) which should prove highly advantageous to buyer and seller. On and after that date, Republic will quote a delivered base price to any common carrier destination in each of the 1481 counties to which Republic normally ships this

product. The delivered base price consists of the mill price per 100 pounds plus all transportation charges, including taxes.

This system, which later will be extended to cover other products, will enable buyers to ascertain the exact delivered base price instantly and without going through the involved process of figuring intricate transportation charges. This noteworthy attempt to clarify and simplify the price structure may prove to be one of the smartest moves inaugurated in steel merchandising in many years.

* * *

OUR TIN CAN ECONOMY: In some ways it is easy to think of the steel container or "tin can" industry as one that is as distinctly American as apple pie. Where else would you find a situation where the average family uses the contents of 788 cans a year (or 219 cans per person)? Where else would you find a gain as pronounced as that in the United States where the household consumption in 1939 was 486 cans and in 1900 a bare 130 cans?

Equally significant, if not more so, is the canmakers' achievement in conserving tin. Ponder this statement: Compared with 1941, canmakers last year consumed 19,128 tons less tin (p. 66), although producing 8 billion more cans with no loss in quality. In 1941 it took 1.31 pounds of tin to make a base box of tin plate; today it requires 0.598 pound.

Important is the fact that because of numerous improvements an increasing volume of products are being marketed in tin-free cans.

* * *

STEEL USERS IN WEST: According to information supplied to Kaiser Steel Corp. by 850 steel consumers, consumption of steel mill products in seven states of the Far West totaled 5,981,000 tons in 1951, 5,347,000 tons in 1952 and will hit an estimated 6,300,000 tons in 1953. In 1952 and 1953, about 58 per cent of the tonnage consumed came from western mills and 42 per cent from mills outside of the seven western states. Leading products, in order of tonnage consumed in 1952 (p. 56), were hot-rolled bars and bar size shapes, plates, sheets and strip, tin mill products, all other products, pipe and structural shapes.

A breakdown of 1952 shipments shows that California took 80 per cent of the steel consumed in the seven states. Southern California received 41 per cent of the total tonnage, northern California 39 per cent, Oregon and Washington 15 per cent and Arizona, Nevada, Utah and Idaho 5 per cent.

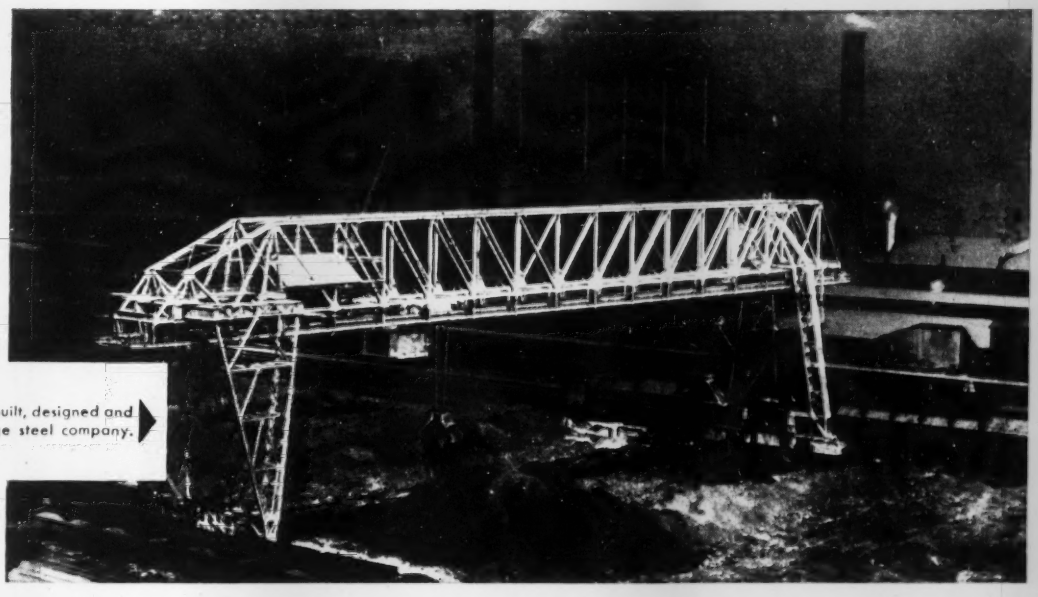
* * *

BUYS MORE EQUIPMENT: Figures compiled by the Office of Business Economics of the Department of Commerce show that American industry has stepped up its purchases of production plant and equipment (p. 60) by a large margin during the last three decades. For instance, producers' durable equipment purchased in 1951 and again in 1952 was valued at $22 billion each year. In 1929, which was the best year of the twenties, comparable purchases totaled $5.5 billion. This means that today equipment buying is from 3 to 4 times what it was 25 to 30 years ago. If one adjusts the figures to allow for changes in value of the dollar, purchases in the fifties are running more than two times those of the twenties. All major groups of equipment contributed to the gain, but purchases of machinery led in the percentage of increase.

* * *

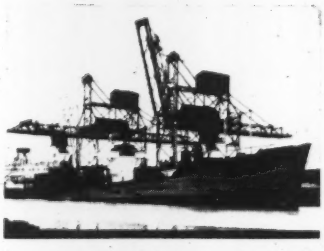
INDUSTRY'S NEW HONOR: If you are an officer of a typical metalworking corporation you have noticed the pressure applied to you by friends who plead with you to contribute liberally to the building fund or the operating expenses of XYZ College. The sales talk is that XYZ is a private educational institution. Unlike the opulent universities supported by federal or state funds, it has to rely upon private endowments or contributions. The rich individuals who at one time performed this function more or less satisfactorily are extinct. Apparently the honor of being the patron saint is offered to American industry.

Thousands of industrial corporations are meeting this new challenge resolutely. Many are chartering foundations (p. 59) to receive contributions for charitable and educational purposes. Funds contributed in years of gratifying earnings can be made available to charitable, educational and other worthy causes when earnings are low. It is a wonderful way to stabilize worthy giving.



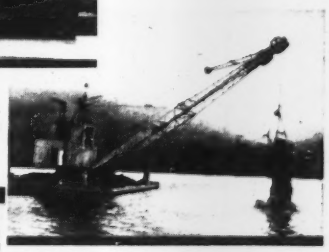
12-ton ore bridge, built, designed and installed for a large steel company.

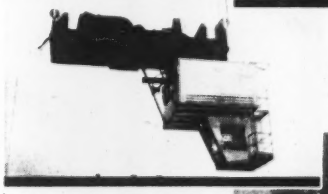
DRAVO **HEAVY MATERIALS-HANDLING** EQUIPMENT ...CUSTOM BUILT FOR **YOU!**



Travelling unloading towers built to handle imported iron ore at an Atlantic port.

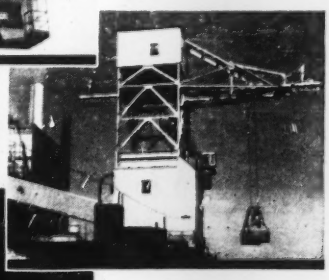
Whirler crane mounted on pontoon hull is used for dredging and general contract work.

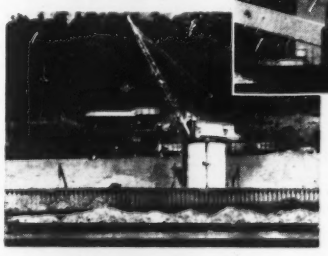




Light-weight man trolley installation increased bridge handling capacity 60%.

Coal unloader designed and built for a large mid-western electric power company.





Stationary whirler crane designed and built to transfer coal from barges to hopper cars.

Over-all economical and safe performance is best obtained by using materials-handling equipment designed to suit your operating conditions. If you're planning a new materials-handling installation, we suggest an early "Round Table" session with Dravo engineers.

From actual experience over the past 60 years in building and installing the equipment shown here, valuable data is available in working out the features you want in your installation. This information, along with your own operating experience, can be used to create a design incorporating all the best features for easy maintenance, a high safety factor and simple, economical and satisfactory operation.

You can profit by taking advantage of this specialized "Round Table" service.

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CORPORATION

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AIR CONDITIONING • BOILER AND POWER PLANTS
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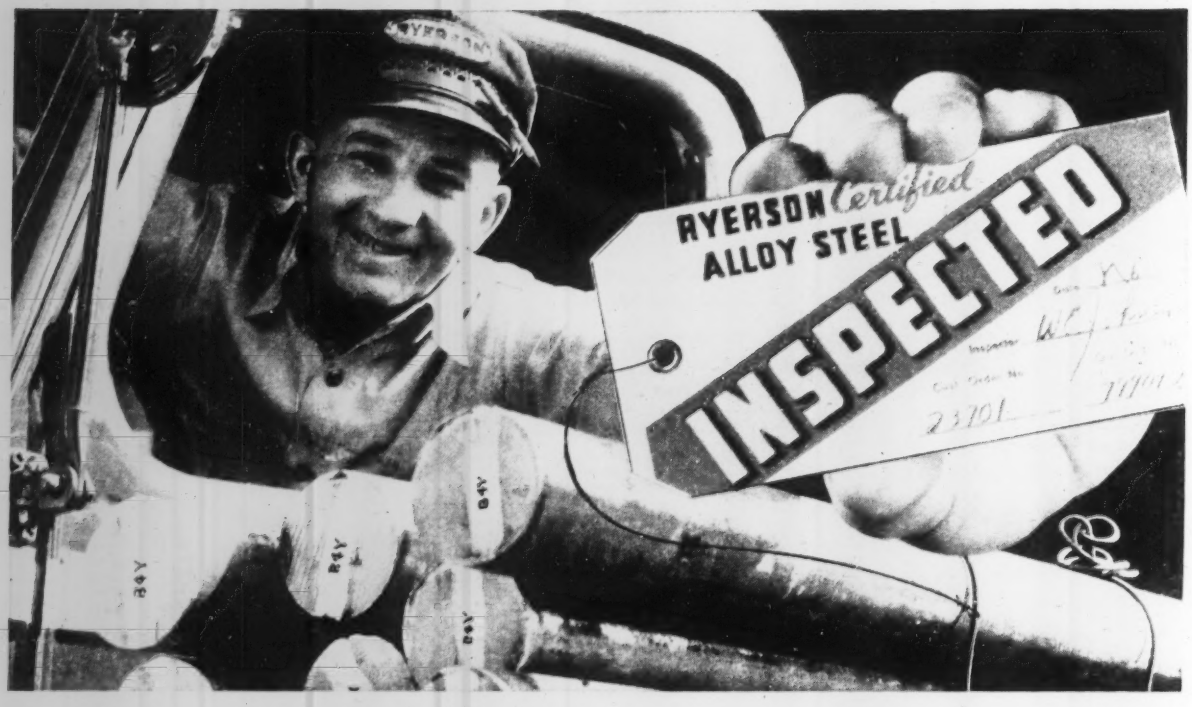

danger of wrong alloy

eliminated

by Ryerson 8-step quality control

Two bars of steel may look alike—may actually have been bought as the same alloy—but even seemingly identical bars may vary widely in analysis and performance. To remove completely the risk of getting steel that will not perform as you expect it to—we developed the Ryerson Certified Alloy Plan.

Under this unique Ryerson system of quality control, your protection begins with the careful selection of heats to be carried in stock. Next, we verify the analysis of each selected heat. Then, after spark testing to guard against mixed steels, we permanently identify each bar with a stamped heat symbol and color marking. Meanwhile, we test a sample of every heat for hardenability and interpret the test results for you.

Finally, before these selected steels are shipped, a thorough inspection is made to see that every step in the control plan is followed. Only then, after every detail has been double-checked, is your order of Ryerson alloys approved for delivery. And with your shipment you receive a certificate providing complete test data to prove quality and guide your heat treatment.

You pay no more for Ryerson Certified Alloys, but they will prove real money-savers for you. To get these controlled-quality steels promptly—just call your nearby Ryerson plant.

RYERSON CERTIFIED STEELS

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
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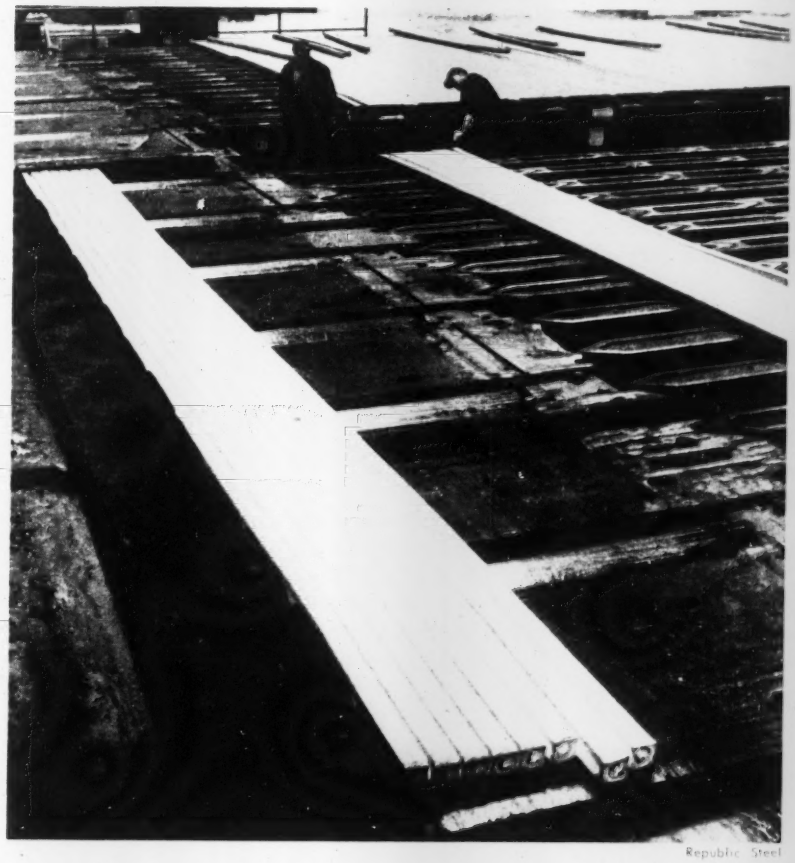


Republic Steel

Steel Gets New Pricing Method

Republic introduces simplified procedure for quoting delivered prices on county basis. It starts with hot-rolled carbon bars, but will be extended to other products

STEEL buyers will be relieved from a lot of computing headaches and bookkeeping requirements in handling transportation charges by a new simplified method of pricing steel products.

The procedure, to be introduced by Republic Steel Corp. Dec. 15, will enable the buyer to quickly determine the delivered base price to his plant and to more easily choose the mill source having the lowest delivered price.

The new pricing method at first will apply to hot-rolled carbon bars only, but later will be extended to other products.

Delivered Prices—In substance, Republic will establish a policy of selling and delivering hot-rolled carbon bars to any common carrier destination at a published delivered base price. It will include in this delivered base price all transportation charges and tax.

Prices have been established for delivery from each of the five mill points at which Republic produces hot carbon bars to each of the 1481 counties throughout the country into which the company normally ships this product.

New Mill Prices—Republic has established new mill prices for hot-rolled carbon bars at its producing points as follows:

Chicago	$4.22 per 100 pounds
Cleveland	4.21 per 100 pounds
Youngstown	4.20 per 100 pounds
Buffalo	4.18 per 100 pounds
Gadsden, Ala.	4.18 per 100 pounds

Company will deliver to any common carrier destination at these prices within the county or counties covered by the switching area immediately adjacent to each mill provided the company can choose the transportation method. If the customer wishes to take delivery at the mill in his own transportation equipment, he may do so at the mill prices.

How It Works—A study has been made of the lowest transportation costs to deliver steel into each county normally served by Republic. On this basis, one delivered price is established for delivery to all common carrier destinations in each county from each producing mill. Material will be billed at the delivered price plus any sales, use or other state and local taxes.

For example, the price of hot-rolled carbon bars in 80,000-pound minimum shipments delivered to Franklin county, Ohio, is $4.41 per 100 pounds for material produced at Cleveland; $4.46 for Youngstown bars; $4.56 for Chicago bars; and $4.62 for Buffalo bars. Obviously, a customer would order bars produced at Cleveland if Cleveland were a producing point for the size and quality the customer desired.

Easy—Each customer will be supplied with three documents which will enable him to quickly determine the delivered price of bars shipped to his plant from any of Republic's producing points. They are:

1. Hot-Rolled Carbon Bar Manual, which is a listing of the sizes, grades, processing facilities available at each of the company's mills.

2. County Symbol List, which is an alphabetical listing by states of all counties into which delivery is normally made. All counties (except those in which the mill is located) are identified by a number from 1 through 39.

3. Base Price Sheet, which will translate the county symbol into

the actual delivered base price.

Alternate Transportation—If the customer specifies a more expensive method of transportation or if he fails to release sufficient material from one mill for shipment at one time to one destination to permit the use of the most economical transportation method, the customer will pay the additional transportation cost. The County Symbol List often lists additional charge for alternate transportation.

In announcing the new procedure, Norman W. Foy, Republic vice president-sales, says the delivered cost to customers under the new plan will be substantially the same as under the former pricing method. In some cases slight reductions and in others slight increases are noted, but in no case is the change significant.

Advantages—Benefits to buyers are:

1. The delivered base price is instantly available to the customer from published material supplied to him by the company without the necessity for his computing the transportation charges.

2. Republic produces hot-rolled carbon bars at several mills. The customer can determine from the published information exactly what products, size ranges, etc., are produced at each mill and which has the lowest delivered prices to his destination.

3. The customer avoids all of the bookkeeping requirements involved in handling transportation charges. He has no freight damage claims to prosecute and no transportation to arrange.

Company Gains, Too—The principal advantages to Republic are:

1. Salesmen can make delivered price quotations to the customer from information that he carries with him. Previously, it was necessary to refer such quotations back to traffic experts at the home office for the calculation of delivery charges.

2. It will relieve the sales organization and the traffic department of the necessity of making numerous calculations from the fantastically complex rail and truck freight rate structures in connection with each individual order.

3. The simplification of the pricing structure will result in a substantial reduction of the clerical work in the sales, traffic and accounting departments.

Forty Possible Prices—The procedure reduces to 40 the possible prices for hot carbon bars, depending on the distance from the producing mill to the customer's plant. Under the former methods, there were many thousands of possible prices, and these generally were figured out to four decimal points. The new method rounds out all prices at two decimal points.

The new pricing method involves only the base prices and the transportation costs. Extra charges for special services will continue to be added as heretofore.

The pricing procedure has no connection with freight absorption to meet competition. It will, of course, simplify the pricing structure and may make easier the determination of when and where the company wants to absorb freight.

Far West Steel Appetite Grows

CONSUMERS in seven states of the Far West have supplied a market for 6.3 million tons of steel mill products this year, an all-time high.

That's the estimate of Kaiser Steel Corp., made on the basis of information supplied to the company by 850 steel consumers. Of the 1953 total estimated consumption, approximately 58 per cent of the steel will have been supplied by production from western mills. The remaining 42 per cent originated from mills outside the seven western states.

Equal Percentage—In 1952, western consumers received 5,347,000 tons of steel mill products, or 11 per cent under the 1951 peak of 5,981,000 tons. The drop reflected the affect of the 1952 steel strike. Of the total 1952 receipts, western mills provided approximately 3.1 million tons, or 58 per cent, the same percentage as estimated for 1953.

The report, believed to be the only one of its kind published in the industry, gives a subregional breakdown of last year's gross steel receipts within California, Oregon, Washington, Idaho, Arizona, Nevada and Utah.

Last Year's Record—Estimated regional shipments last year were: Southern California, 2,227,000 tons, or 41 per cent of the total; northern California, 2,106,000 tons, or 39 per cent; Oregon and Washington, 794,000 tons, or 15 per cent; and Arizona, Nevada, Utah and Idaho, 238,000 tons, or 5 per cent.

Steel mill product receipts in the seven western states were given as follows:

Product Group	1951 net tons	1952 net tons
Plates, Sheared and U. M.	1,155,000	939,000
Structural Shapes	468,000	414,000
H. R. Bars & Bar Size Shapes	1,088,000	1,030,000
Sheets & Strip	925,000	869,000
Standard and Line Pipe	453,000	475,000
Tin Mill Products	876,000	867,000
All Other Mill Products	1,075,000	821,000
GROSS TOTAL	6,040,000	5,415,000
*Conversion of receipts into mill products	59,000	68,000
NET TOTAL	5,981,000	5,347,000

*Steel mill products received in the seven western states and converted into tubing, cold-rolled strip, and cold-finished bars have been subtracted from gross receipts to avoid duplicate reporting of the same tonnage.

Steel Warehouse Outlook: Still Good in 1954

THE STEEL warehouses are going to do all right next year even though the hectic pace of recent years will be absent.

That was the view expressed by speakers on a panel at a directors' meeting of the American Steel Warehouse Association which was conducted ten days ago at the Homestead in Hot Springs, Va.

Business will be off from 1953 volume, but should better that done in both 1950 and 1951, the distributors said. While most products are now in relative supply balance with demand, such items as wide flange sections and light plates continue noticeably

scarce. Competition will be sharper next year. Collections will be of increasing concern from here on, in the opinion of some operators.

Reports from several areas were presented:

Pacific Northwest — Prospects are encouraging for good business. Large tonnage orders are being replaced by small lots, but indications are these will result in larger overall movement. Wide flange structurals, hot and cold-rolled sheets and light plates continue in short supply.

Los Angeles—Business volume is good, but collections are slower. Hot and cold-rolled sheets are being received in better volume and stocks will shortly be back to normal. Wide flange sections and light plates, however, are in limited supply.

Texas—While business is down somewhat this year due to strikes in construction and the drought, volume is fair. Hot-rolled sheets are in excess supply. In general, however, steel supplies still are inadequate and 10 to 15 per cent of district warehousemen are filling holes in their inventories by buying imported steel. Customers' orders are smaller.

New England—Wide flange sections and light plates are short but galvanized sheets, alloys and stainless are plentiful. No rush to obtain nickel-bearing stainless has developed despite lifting of government nickel controls. Operators report business this year up about 10 per cent over 1952. They anticipate continued good volume in 1954.

New York—Inventories are up, with galvanized, cold-rolled sheets and screw stock in easy supply. Expected rush of consumers to obtain stainless nickel-bearing sheets following lifting of nickel controls failed to materialize. Imported steel is coming into the district below domestic mill prices.

Baltimore and Philadelphia—Inventories are back to normal with mill deliveries substantially improved. Collections appear to be slowing slightly. Competition is expected to be stiffer next year. District warehousemen anticipate a fair first quarter. Poll shows 12 think it will be good and 18 fair.

Union Survey Draws Mixed Response

Replies to steelworkers' questionnaire on insurance and pension plans have been coming in satisfactorily, the union says. Steel companies balk at giving some answers

CO-OPERATION, up to a point, marks the response thus far to the United Steelworkers' questionnaires on insurance and pension plans in current use by the steel industry.

Such joint management-union activity, coupled with the get-together tour of Benjamin F. Fairless, U. S. Steel Corp. chairman, and David J. McDonald, United Steelworkers of America president, may set the tenor for a new approach to labor-management problems.

More Coming—Many steel companies already have completed part of the steelworkers' questionnaire and returned it to the union. "Yes, we've had a satisfactory response," says John Tomayko of the union's contract department. A spot check by STEEL revealed there are still more companies in process of gathering data for their insurance and pension plan questionnaires which will be forwarded to the union as soon as possible.

The point at which many companies balk in answering is where questionnaires probe beyond aspects which could be covered through collective bargaining with the union. That would include data on pension and insurance plans for white collar workers who are not unionized and pension plans where employees make no contribution to the general fund.

Scattered—Not all companies have replied to the union questionnaires because the union began sending them out piecemeal on Aug. 21 but did not send the last batch until Nov. 18. Covered by the mailings were 2400 companies with which USA has a collective bargaining contract, including fabricators as well as basic steel producers. The union has asked about insurance before, but this year's questions are the most comprehensive yet. This is the first time USA has queried the industry on pensions.

A portion of the questions for the survey were developed through preliminary work of fact-finding panels composed of both union members and representatives of U. S. Steel Corp., Jones & Laughlin Steel Corp., Republic Steel Corp. and Bethlehem Steel Co. Those nonbargaining, fact-finding committees were set up at the time of the last wage discussions earlier this year.

Who Pays?—Much of the information requested by the union is made available, under regular company policy, to employees. Other questions could be answered only by the insurance company involved in the plan. Still other information had to be tabulated by the steel companies themselves. Altogether, the compilation of answers for the union questionnaires is costing the steel companies a considerable amount of money.

That there has been practically no haggling over who will foot the bill for the job is another token of goodwill in the direction of better relations between management and union.

Bridge Beginning

Husky trusses being assembled at the Gary, Ind., plant of U. S. Steel's American Bridge Division are for a new four-leaf, bascule-type bridge over the Chicago River. The 147-ft trusses will be pre-fit and match-marked for installation on the site

Wire Products Industry:

Because of its diversity and adaptability, producers face the new year with confidence

PRODUCTS for everything from TV sets to fishing rods: That's the diversification found in the wire products industry, and that wide range of uses is one reason for the optimism that pervades the business.

While there are no figures for production of the industry as a whole, most manufacturers in this specialized business contacted by STEEL view 1954 with a rosy tint. They point out that 1953 has been a good year—better than any other for many of them—and that backlogs and first-quarter orders for next year give indication of brisk business to come. It is true the pace of the second half of this year has not been as fast as the first half and that competition is becoming keener than ever, but most producers are unalarmed.

Two in One—There are really two segments of the over-all industry; one makes special wire forms, such as retainer rings and spring-wire products as components for other fabricated goods, and the other makes wire baskets, display racks, oven and refrigerator racks and other such products, many of which are fabricated end items.

But the diversification feature is common to both segments. Manufacturers point out that if business falls off on one of their many products, it is just as likely to pick up on another and thus balance their output over the long run. As one producer puts it, "Our company makes products mostly for the automotive industry. Generally, we will go as the automakers go in 1954, but even if that business falls off, our machinery is adaptable to other wire products."

Adaptability—The fourslide and multislide machines this industry uses generally have standard beds, slides and feeds. For the most part, wire formers do not stock tools because each job is specialized. There are few "standard" shapes, inasmuch as the producer makes each wire form from the purchaser's blueprint. One large Cleveland wire former says he has six men at work all the time doing nothing but making new dies.

The simplicity of the operation has contributed to the intense competitive nature of the industry. One Pittsburgh producer says: "A newcomer to the industry only needs one machine and he is in business. A fabricator will concentrate on a single item such as curtain rods. With his low overhead he can cut into business of a company producing a diversified line of products."

It is not known just how many firms are in this business. One producer estimates as many as 500, however. Many spring manufacturers have a wire forming department as a sideline, and there are many job shops. But one large wire former estimates that 15 companies do 90 per cent of the business.

Choice of Materials—Chief raw material for the industry is low carbon steel wire, in most cases SAE 10-10, although some high carbon MB spring temper wire is used. For some operations, copper and brass wire is best. Little stainless steel wire is used, but when it is, producers prefer the nickel-bearing type.

Aluminum is getting a bigger share of the wire products business, both in the formed wire segment and the fabricated wire business. Several important uses in the former field are locks for aluminum storm windows and in television antennas.

The potential applications for wire products are seemingly limitless. As long as those applications continue to be developed, the industry will continue to prosper.

How Much

CORPORATE contributions to charitable, educational and other institutions should they be handled on a strict business percentage-of-earnings basis or should each request be treated individually on its philanthropic merits?

With corporate gifts expected to hit a record $500 million this year and with the excess profits tax doomed to oblivion Dec. 31, the contributions problem is an important one for manufacturers.

Up or Down?—You can make your own prediction on whether the contributions will increase or decrease next year. Without the excess profits tax, some say, there will be less tax advantage for making large contributions. On the other hand, others relate that in the absence of the excess profits tax earnings will be higher and therefore contributions will be easier made. One thing is nearly certain: Requests for contributions aren't going to decrease, and management will continue to be faced with how much to give to whom.

Although most companies are reluctant to admit it, excess profits tax can be credited with increasing many a firm's contribution. As one official points out, if a company is in the million-dollar earnings bracket, it has an 82 per cent tax bill which leaves it $180,000 after taxes. If it gives $100,000 in contributions, the tax bill is $738,000 on the $900,000 figure and it has $162,000 left. It gave $100,000 at an actual cost of only $18,000.

Cost Going Up — But without EPT, the contributions cost to the manufacturer will be 50 cents on the dollar under a 50 per cent corporation tax which is being forecast by many.

Most companies today do not make contributions according to any definite pattern. Major influences are the company's financial position, the importance of the organization to the community in which the company is located, number of employees, whether the con-

Corporate Giving?

No. 426

Everytown, U.S.A. Jan - Dec 1953

Pay To The Order Of Philanthropy — $ 500,000,000

Five hundred million and 00/100 Dollars

American Industry

tribution can be justified as being "in the best interest of the company" and what other companies of similar size are giving.

Community Service—Most firms, like Norton Co., Worcester, Mass., place special emphasis on the "community service" idea. Norton contributes heavily to the city's community chest, it has endowments with Worcester Polytechnical Institute and supports five and six scholarships per year, and when the tornado struck last June Norton was one of the first to pitch in with thousands of dollars for assistance.

Some companies place their emphasis on educational contributions with the hope that trained personnel or special information may be obtained in return. These take the form of scholarships or special foundations for students, research grants and new building gifts.

Trend Up—Education appears to be getting an increased amount of contributions from corporations. The recent Industry-College Conference in White Sulphur Springs, W. Va., indicates that more emphasis will be made to get greater industry support of educational institutions. One official declared at the conference that high personal and estate taxes have withered much of the individual's support of private schools, and the institutions have been forced to turn to industry. Recent U. S. Supreme Court rulings may give added impetus to the movement. Many state laws require that companies get stockholders' consent before making certain contributions. In a test case, the Supreme Court ruled that grants to education may be made by corporations without stockholder consent.

A survey of 207 companies in the Cleveland area by the Harvard Business School Club tabulated these figures as average percentages for the companies' 1952 contributions: Community chest, 45.1 per cent; Red Cross, 6.7 per cent; colleges and universities operations, 12.3 per cent; miscellaneous, 10.5 per cent; and building funds, 25.4 per cent.

A Leveling Process—The establishment of foundations to handle company contributions is being adopted by more and more companies. The Cleveland survey indicated that 23 per cent of the companies had foundations, many of which were founded within the past two or three years.

Foundations are subject to approval by the Bureau of Internal Revenue and are eligible for gifts which are deductible up to 5 per cent of the corporation's annual taxable income. Philanthropic foundations are usually operated by the parent corporation. One of its major advantages is that it can serve a "leveling function" for the corporation's contributions during lush years more money can be afforded and placed in the foundation in reserve for lean years when company earnings might otherwise dictate lower or possibly no philanthropic contributions.

Growing Need—Corporate giving is definitely on the increase. Favorable company earnings in recent years have been a factor, but industry is also aware of the need for health and welfare needs of its employees and of its own need for more trained personnel. In setting up your program, it will pay you to consider these factors:

1. What fields of philanthropy should you consider for support?
2. What screening method should you use in considering each request?
3. What method should be used to gage the amount the corporation should give to each request?
4. In considering a company's annual allotment to philanthropic appeals, should a foundation be established, an annual percentage-of-earnings system adopted or should each individual request be considered on the basis of its merit?

Republic Scores Limestone Find

Republic Steel Corp. has acquired one of the finest deposits of open-hearth quality limestone ever found on the North American continent, C. M. White, president, announces. The deposit is located on about 1100 acres of land near London, Ont.

Officials report sufficient quantities to supply Republic at its present operating rate for several generations. The limestone is chemically almost pure calcite and has dense, microcrystalline structure which makes for ideal melting characteristics in steel furnaces.

The deposit is favorably located for transportation to Republic plants in the Mahoning valley, Canton and Massillon, O. Transportation will be by rail to Port Burwell, Ont., and then in car ferries across Lake Erie to Ashtabula.

Private Purchases of Producers' Durable Equipment, 1929 & 1952

(Millions of Dollars)

Product Group	Value		Volume*	
	1929	1952	1929	1952
TOTAL: Producers' durable equipment	5,568	22,046	7,956	17,417
Furniture and fixtures	361	855	471	683
Fabricated metal products	132	360	185	298
Engines and turbines	54	268	85	204
Tractors	186	976	203	730
Agricultural machinery (except tractors)	265	1,161	346	844
Construction machinery	90	640	169	468
Mining and oil field machinery	143	792	239	585
Metalworking machinery	233	1,197	346	872
Special industry machinery	407	1,574	608	1,209
General industrial machinery	440	1,585	643	1,154
Office and store machinery	201	750	209	671
Service industry and household machinery	186	926	265	823
Electrical machinery	443	2,865	529	2,463
Trucks, buses and trailers	590	2,466	853	1,900
Passenger cars (for business use)	1,105	3,309	1,635	2,573
Aircraft	41	167	65	123
Ships and boats	75	192	123	154
Railroad equipment	374	935	623	807
Instruments	81	588	88	496
Miscellaneous equipment	161	440	271	360

*Constant 1947 dollars adjusted for price changes

Spending for Production Equipment Rises

Nearly four times as many dollars are spent for production machinery now as in 1920s. It's not all for replacement either. Stocks have nearly doubled in last ten years

AMERICAN BUSINESSMEN are spending relatively more for new production equipment now than they did before World War II. That long-term trend was brought out in Commerce department data recently released by the Office of Business Economics.

During the 1920s, between 5 and 6 per cent of total fixed capital output went equally to equipment purchases and nonresidential construction (see the accompanying table). Since the war, however, equipment purchases have been about 6.5 per cent of total output while nonresidential construction has been only 3 per cent.

Somewhat Higher—Specifically, equipment purchases were $22 billion in 1951 and again in 1952. That's about 3 to 4 times the actual dollar value of such buying in 1929. Preliminary information indicates equipment purchases may be "somewhat higher" in 1953, says the OBE.

Even squeezing the inflation out of the increase, equipment purchases in the past five years have averaged about twice those of 1929 in physical volume.

All Participate — All major groups of equipment contributed to the gain, but machinery purchases increased the most, accounting for 58 per cent of the purchases in 1952 compared with 48 per cent in 1929. The relative share of transportation equipment declined from 39 per cent to 32 per cent during the same period; other equipment (business furniture, instruments and fabricated metal products) slipped from 13 per cent to 10 per cent of total production equipment purchases.

Electrical machinery, instruments, tractors, construction machinery, mining and oil field machinery and metalworking machinery actual dollar purchases were at least five times the 1929 level in 1952. Purchases of ships and boats, railroad equipment, business furniture and fixtures, fabricated metal products and miscellaneous equipment were between two and three times the 1929 level in 1952.

Investment in production equipment was not merely for replacement demands. Gross physical stocks of privately owned equipment increased about four-fifths between the end of 1941 and the end of 1952.

Impetus to Shell Molding

Shell molding was given a new impetus when Shalco Engineering Corp., Palo Alto, Calif., demonstrated its newest low-cost shell molding machine before more than 500 foundrymen from all parts of the West at a symposium held at the South San Francisco plant of Reichhold Chemicals Inc.

The present production model of the Shalco machine is the outgrowth of an experimental machine developed a Stanford University and shown for the first time a year ago by the university's graduate school of business, headed by Prof. Frank Shallenberger. Original object of the student program was to produce a low-cost unit which would bring the shell molding process within reach of the typical small foundries and manufacturers of the West. Although the group failed to produce such a unit for $1000, the machine demonstrated last week approaches the goal. This double-ended molder which can produce 14 foot by 18 foot molds at from 40 to 60 an hour is being sold by Shalco complete at less than $3000. More than 100 such machines have been made since June and are in use throughout the country.

Reichhold Chemicals' interest in shell molding is in the powdered phenolic resin it makes for the process, according to J. J. Bogner of the company's San Francisco foundry sales division.

Machine Tool Orders Dip

The index of new orders for machine tools dipped to 199.2 in October, the first time the index has dipped below 200 since June, 1950, National Machine Tool Builders' Association reports. The index is based on the 1945-1947 period as 100.

Shipments of machine tools, however, were ap 20 points from September to 348.2, the highest figure since May of this year.

Keystone Will Expand Wire Mill

Keystone Steel & Wire Co., Peoria, Ill., plans a $661,000 expansion of its wire mill rod processing facilities, R. E. Sommer,

president and general manager, announces.

The program will include construction of a 36-base gas-fired muffle furnace, installation of an overhead traveling crane and new building.

Kaiser Starts Fast Mill

High speed production of induction welded aluminum tubing is underway at the Trentwood, Wash., works of Kaiser Aluminum & Chemical Corp.

Speeds up to 120 feet a minute are said to be possible on the newest type of tube forming equipment developed by the Yoder Co., Cleveland. By use of different sizes of forming rolls, the Yoder mill has a capacity to produce welded aluminum tubing in diameters from $^3/_4$ inch up to 4 inches. Range of wall thickness is from 0.025 to 0.134 inch.

Kaiser at the outset will concentrate largely on irrigation tubing of 3 and 4-inch diameter, company officials said.

Nickel Exports Open-Ended

An "open-end" export quota has been established for the fourth quarter of 1953 for certain nickel products, Bureau of Foreign Commerce announces. Under the quota, no quantitative limits are set, but exports are controlled to safeguard national security.

Time schedules for filing applications to export all nickel products have been abolished and applications can now be made at any time.

The open-ended commodities include nickel metal in bars, rods, sheets, strips, spent nickel catalyst and other crude forms.

Controls Snapped on Titanium

Business & Defense Services Administration has issued a notice authorizing the control of the general distribution of titanium sponge and titanium ingot and mill products, C. F. Honeywell, administrator, announces.

BDSA took the action because the scarcity of titanium does not permit defense needs to be met without the control.

Wide World

Engines with Push

J57 jet engines near the end of the production line at the Pratt & Whitney Aircraft plant in East Hartford, Conn. The engines are rated by the Navy in the 10,000-pound thrust class

The Stage Is Set

Defense department outlines its policy for the mobilization base program

THE STAGE is set by the Defense department for spending up to $850 million on the mobilization base program.

Under directive 4300.9 issued by C. S. Thomas, assistant secretary of defense for supply and logistics, the three armed services will formulate plans for using all or part of $250 million appropriated by Congress for procurement of a machine tool reserve in fiscal 1954 and $600 million in carryover funds from last year for machine tools, production and storage facilities for the mobilization base. There's no assurance the armed services will follow the script and spend the total $850 million, but this amount sets an upper limit on their plans.

For the Interim—The funds will be used, according to Defense department policy, to prepare for the interim mobilization period between the initial and duration stages, when reserve plants would supply the critical balance of defense needs.

Emphasis will be placed on procurement of long lead time machine tools where conversion to defense production would be held up through lack of such tools. To at least some extent, the projects will include expansion of capacity for producing certain types of tools. These funds will not be used to buy and/or store machine tools which could be built in the time it would take to build and activate the facility which would use them.

Exceptions—Except in unusual cases, the setting up of complete facilities, including machine tools and equipment, will be shunned. Exceptions would be where the Defense department would have to dismantle production lines or move government equipment at great expense in order to gain needed production capacity. Again, projects will not propose buying machine tools to round out a production line if the complementing tools and equipment have been dispersed.

Hoover Task Force Staff Named

Staff members of the task force to study the use and disposal of federal surplus property have been announced by former President Herbert Hoover, chairman, Commission on Organization of the Executive Branch of Government.

The group will investigate and make recommendations for disposal of an estimated $25 billion worth of surplus or obsolete property on hand now and for handling of surplus in the future.

Headed by Gen. Robert E. Wood, Sears, Roebuck & Co. chairman, the staff will include: Russell Forbes, deputy administrator of General Services Administration; Harry Erlicher, president, Loughborough Mining Co. and former General Electric Co. vice president; Leroy D. Greene, former Bethlehem Steel Co. official; Carl A. Ilgenfritz, U. S. Steel Corp. vice president; Thomas D. Jolly, Aluminum Co. of America vice president; James D. Mooney, former General Motors Corp. vice president and Willys Overland Motors Inc. president; George A. Renard, executive secretary-treasurer, National Association of Purchasing Agents; Walter W. Tangeman, Cincinnati Milling Machine Co. executive vice president.

By E. C. KREUTZBERG *Washington Editor*

Storm Brews as U.S. Industry Seeks Bigger Atomic Role

AMONG CONTROVERSIES gathering steam in Washington is that over industry's future participation in the new atomic energy business. Everybody is agreed that the point has been reached where private industry should be admitted into this show, but there are two schools of thought. One points out that a huge government investment has provided a huge fund of knowledge and is concerned lest private investors make small investments, add a little bit to this knowledge, and then gain an exclusive position with patent protection; this school contends that government control over the technology should be continued. The other school holds that if we are going to attract private enterprise into the atomic energy business, private ownership of patents must be recognized as an incentive to attract private capital.

Mr. Cole Believes . . .

Inasmuch as Rep. W. Sterling Cole (Rep., N. Y.), as chairman of the Joint Committee on Atomic Energy, will be the key man in shaping policy, his views are significant.

"If our objective," he says, "is to revise the atomic law not only to protect our national security but also to arouse and attract private investment and activity into the peacetime possibilities of this field, then we must remember that to the extent to which we circumscribe and put limitations upon the patentability of improvements we to that same extent discourage investors from searching for the improvements."

He is not much worried over dangers of allowing full patent protection to private individuals and firms in the atomic field. "Every day," he says, "some inventor is able to capitalize upon some minor but ingenious adaptation of an invention which has become public property through the lapse of time. I see nothing in the atomic aspect which should cause us to apply a drastically different patent process."

Mr. Zuckert Concurs . . .

The Atomic Energy Commission, whose recommendations will be the springboard from which Mr. Cole's joint committee will formulate new legislation, also, according to Commissioner Eugene M. Zuckert, "believes that private industry should receive tangible encouragement that atomic energy patents eventually will blend into our basic patent policy."

The Experience Is Confined . . .

How will the development of atomic energy affect your business in the next decade?

Relatively a handful of companies mainly large ones operating on Atomic Energy Commission contracts are in a position to answer this question in terms of their own plans. But well over 90 per cent of companies know too little of what is going on in the field to plan to take advantage of opportunities which even now are becoming available.

Mr. Warren Has Advice . . .

In view of this general lack of information in a new sector of industry, more than usual news significance attaches to the opening of a consulting engineering office at 1518 K street, N. W., Washington, by Frederick H. Warren, one of AEC's former top operating officers. He proposes to work with staffs of private companies and help them develop products in line with potential needs and technology of the atomic energy business.

FREDERICK H. WARREN
. . . atomic consultant

"Unfamiliarity with a field in which facts lie behind closed doors tends to exaggerate the difficulty of problems in that field," Mr. Warren told STEEL. "With a close look, much mystery disappears.

"Certainly the opportunities are ultimately there in many diversified forms", said Mr. Warren. "They run the gamut from radioisotops tracer work to brand new metallurgical demands for nuclear qualities, corrosion resistance and high heat transfer from nuclear reactors and components to means of using radiation wastes.

"The situation is unique in industrial history. The government's ten-year investment is approaching $10 billion in creating a major industry and operating it to produce weapons. There are indications that the second atomic decade will bring private industry into the field in a big way. It is no wild speculation to predict that private industry in this decade will invest well over $100 million in this field. All that is needed to get this trend started is for more companies with progress-minded managements to get an understanding of the opportunities."

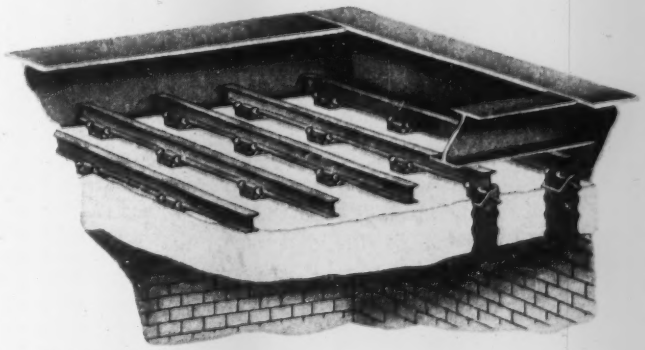
How to get the most out of

Suspended Refractory CONCRETE CONSTRUCTION

An example of B & W's Modern Suspended Castable Construction

Cross section of castable form showing patented anchor tile and "ice-tong" hanger, which can be attached any place on I-beam.

B&W Kaocast may be gunnited, as shown above, or poured into a form.



Cross section of finished B&W Kaocast soaking pit cover, showing anchor tile and "ice-tong" hangers.

The big reason behind today's growing use of suspended castable construction is lower installation cost. The replacement of standard brick and special shapes by refractory castables (just as easy to use as structural concrete) is becoming so widespread that every furnace operator should consider it as a possible means of cutting his own installation costs.

Not only can refractory castables be handled easily, but such troublesome jobs as notching I-beams have been eliminated with B&W's patented anchor tile and "ice-tong" hanger. Maintenance patching is quicker, too, because this hanger can be slipped on or off anywhere on the beam.

But the major reason for the general preference of B&W's suspended castable construction is B&W Kaocast—the only refractory concrete for service up to 3000 degrees. Even at lower temperatures, B&W Kaocast results in longer, more economical service because it has a high resistance to spalling and practically no reheat shrinkage.

The step-by-step story shown at the right is an example of how B&W's modern suspended castable construction is used in soaking pit covers. These covers take plenty of abuse because of the rough handling they get, but B&W Kaocast stays on the job.

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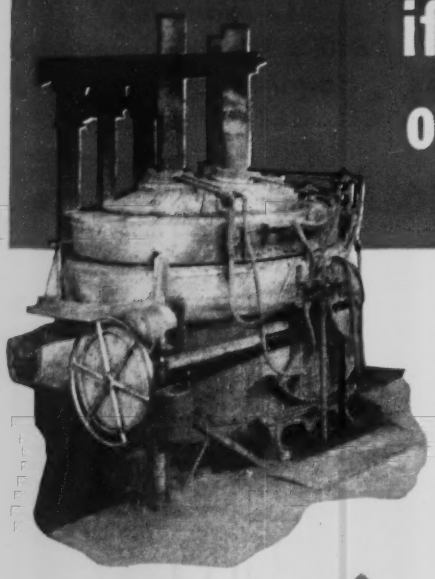
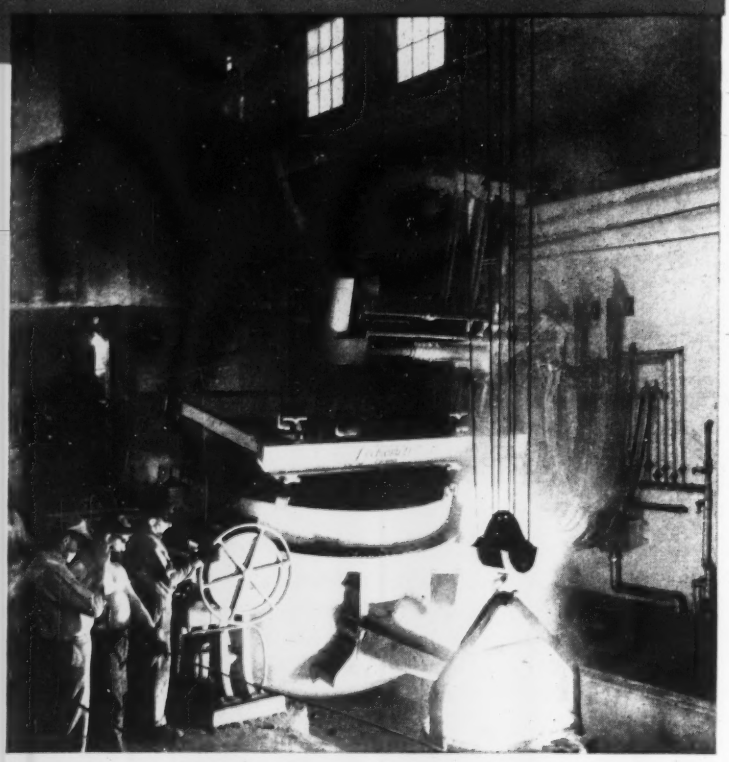
R-485

if you judge a furnace on performance...





For 32 years Empire Steel Castings, Inc., has depended on this Lectromelt Furnace. Rated at 1½ tons, it consistently pours 2½ to 3-ton heats.

New 5-ton Lectromelt Furnace at Empire pours a high-quality stainless-steel heat.

A rugged, 32-year-old Lectromelt* Furnace still works full time at Empire Steel Castings, Inc., Reading, Pa. Empire says, "It's as good as the day it started. Better, in fact, because we found we could pour additional power to it, so we get heats out faster than we first dared to."

On the basis of the performance and reliability of Empire's old furnace, they recently bought a new 5-ton, top-charging Lectromelt. Now they get much closer temperature and chemical control. And new, pin-point analysis control enables them to duplicate uniformity and high grade of molten metal in lot after lot of stainless.

Lectromelt Furnaces will boost your performance record and add to the quality of your metal. Write for catalog #9 describing them in detail. Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh, Pennsylvania.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. U.S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT... *Lectromelt*

Revival of a Market: Spain Gets U.S. Aid

U. S. agreements to build air bases in Spain bring aid commitments totaling $226 million for fiscal 1954. That may be only a starter of Spanish-American trade revival

SPAIN may be the next boom market for American exports.

Opening wedge was the recent U.S.-Spanish agreements for the building of U.S. air bases in that country. "Spain has always been traditionally a good market for American goods, and pent-up demand there will bring a flood of orders that some U.S. companies are already taking advantage of," says S. Riley Williams, vice president of international business, Worthington Corp.

Toting Up—Assistance to Spain totaling $226 million during fiscal 1954 will be furnished under the terms of the Mutual Security Act. Funds for this purpose will include the $125 million for economic, technical and military aid to Spain, appropriated in 1951 and 1952 and now carried over by Congress, and $101 million included in the funds recently appropriated by Congress to carry on the mutual security program for fiscal '54, says the *Foreign Commerce Weekly*.

Though he disclaimed any specific knowledge of what U.S. planners intend to buy in Spain or what would be bought in the U.S. for the air base program, Mr. Williams said: "Our own plant, however, will feel the effects of the lift to the Spanish economy that this aid will give, and it will be felt in the U.S. as well where dividends and remittances from Spanish properties will be paid for the first time in 10 years because of the difficulties of the Spanish economy."

The new 100,000-square-foot plant of the Spanish Worthington Co. at Madrid is expected to be opened by May of next year.

Signs of Metalworking Times

Signs of increased competition particularly in metalworking products are popping up in Europe. Britain has reduced export steel prices to match those of the European Coal & Steel Community. However, some ECSC members are shipping steel below their list prices and not bothering to revise their formal price lists.

In the French department of Loire a new combine has been organized, counter to ECSC theory of breaking cartels into small units to promote competition. The new French combination, Societe des Ateliers et Forges de la Loire, will specialize steel production in each of the five works in the area: St. Chamond—pig iron and castings; St. Etienne—open-hearth steel and plates; Assailly—small steel bars; Holtzer—tool steel; and Firminy—electric steel and cold-rolled products.

And in Germany agitation continues for a reconcentration of the German steel industry to match that going on in France.

Belgians are wagging their heads over the slow steel market and say: "If the situation does not improve, it seems probable that the High Authority will try to arrange a reduction of production in the six member countries of ECSC and limit each one with a fixed quota."

Volkswagen Short in Germany

The scramble for export markets has left the German automobile buyer with a curious problem: The Volkswagen (people's car) is the only standard car which cannot be delivered to the German buyer when ordered.

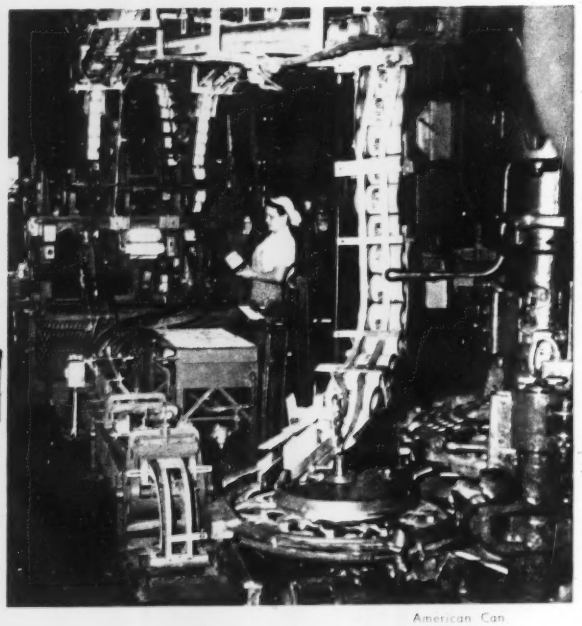
That's because practically 40 per cent of Volkswagen production goes to export markets. From January to October, 1953, output totaled 146,700 vehicles, 88,100 of which went to the domestic market and 58,600 of which were exported. Primary outlet for Volkswagens was and is Europe, especially Switzerland, the Netherlands, Sweden and Denmark. Exports to France and Italy are limited by treaty to 250 vehicles per country per year. Exports to South America and the U.S. have not been large but will get more attention next year.

At present approximately 620 cars and 120 trucks are produced per day at the Volkswagen works; output of 1000 vehicles per day is planned for next year.

Rush Order from Argentina to Africa Via New York

This 10,000-pound General Electric turbine rotor took a quick trip from New York to Durban, Africa, where the *S. S. San Julian*, an Argentine ship, was in distress. Three tons of related equipment accompanied the rotor on its trip approximately one-third of the way around the world. GE service engineers determined what was needed on the ship following an urgent phone call from Argentina

No Lid on Containers



American Can

By B. K. PRICE
Eastern Editor

STEEL CONTAINER manufacturers will produce more this year than last, but will fall short of the 1951 record. That's the picture as 1953 enters its final stages.

First half shipments of steel to all major branches of the container industry (see the table) were substantially higher than in the corresponding period of 1952. Container manufacturers, remembering the steel strike of last year, stepped up purchases as protection against a similar threat this year, which fortunately did not develop.

Pace Slackens—But this pace has not been maintained since. Even if it had been and continued on until the end of the year, steel shipments would fall a bit short of the all-time peak of two years ago. Historically, this industry lags in the closing months of the year, and 1953 is no exception.

Fabrication, though, and this pertains particularly to the major tonnage item of cans is being far better sustained in the closing months than steel shipments. Fabrication levels are good for this season and are sufficient, it is believed, to assure a better year than last. Accumulated steel inventories are making the difference.

Fewer Restrictions Help — Shipments of metal cans during the first nine months amounted to 3,206,926 tons, against 2,985,077 tons in the same period of last year. Shipments of food cans showed little gain 2,061,957 tons compared with 2,004,010 tons but the increase in nonfood cans was substantial, 1,144,569 tons as compared with 981,067 tons, reflecting particularly the easing of government restrictions.

While canmakers see no record for this year, the general uptrend in their business is strong. The average American family now uses the contents of 788 cans a year (or 219 cans per person) against 486 cans annually per household in 1939 and 130 in 1900. A current annual consumption is estimated at 33.5 billion cans, with the market potential of canmakers expanding in line with the increasing population of the country and their proven ability to develop new applications.

Shape of Industry—More than 90 canmakers supply the country's needs. With machines capable of producing up to 450 cans per minute, they service 3500 food canneries in 47 states and have branch plants set up in the food growing areas. American Can Co. alone has 58 strategically located plants in 23 states, Canada and Hawaii. In addition to the food processors, canmakers service literally thousands of canners of nonfood products.

Of particular promise this past year has been progress in the development of cans for the handling of soft drinks. Last summer's requirements of these cans, including the newly developed cap-sealed type, exceeded all expectations, and next year should witness further substantial gains. Canmakers look forward to the time when the soft drink can market might eventually equal or surpass that for beer cans, which now accounts for 500 million cans annually.

Less Tin—The drive for less tin in cans continues. More electrolytic tinning lines are being brought into operation by tin plate producers lines that require from two to six times less tin than the conventional hot dipping process. There are now 33 such lines, it is estimated, with still more in prospect.

Since 1942, when the first of these lines got into commercial operation, the ratio of electrolytic tin plate to hot dipped plate has grown to around 70 per cent. Since the beginning of that year electrolytic tinning and other developments, but particularly electrolytic tinning, have resulted in a saving of 257,000 tons of tin, valued at almost a half billion dollars.

Savings—Compared with 1941, canmakers last year consumed 19,128 tons less tin, although producing 8 billion more cans with no loss in quality. In 1941, it took

SHIPMENTS OF STEEL TO THE CONTAINER INDUSTRY

(NET TONS)

	6 mos. 1953	1952	1951	1950	1949
Cans—Sanitary	1,288,693	2,315,907	2,583,749	2,477,617	1,893,099
Cans—General line	958,443	1,489,005	1,536,743	1,528,667	1,229,124
Crown caps and other closures	178,298	280,049	356,653	332,217	231,293
Steel barrels and drums 19 gage and heavier	281,787	558,448	782,602	590,115	611,840
Steel barrels and drums lighter than 19 gage	101,870	181,463	276,522	221,040	158,142
Shipping pails	93,035	138,500	186,957	114,118	86,487
Compressed gas cylinders	50,750	85,057	93,674	97,154	78,666
Cooperage, boxes, strapping and all others	291,249	502,196	707,054	550,236	366,984
GRAND TOTAL	3,244,125	5,550,625	6,523,954	5,911,164	4,655,635

Source: American Iron & Steel Institute

1:31 pounds of tin to make a base box of tin plate; today it requires .598 pounds.

A large number of cans are now being made without the use of tin at all. This year about 1.5 billion quarts of motor oil will be marketed in tin-free cans. Even the soldering has gone from an alloy of tin and lead to plastic cements. These cans also are used extensively for waxes, varnishes, pharmaceuticals and various dry foods.

Another approach to the goal of tin-free cans is seen in the growing interest in the use of aluminum alloy for special-purpose cans.

Even Keel—Steel shipping container manufacturers estimate shipments this year will run about the same as last—and if this should be the case, shipments will amount to approximately 10 million light drums, 25 million heavy drums and 65 million pails, packages and kegs, as compared with around 11 million, 30 million and 78 million, respectively, in the peak year, 1951.

Higher prices, reflecting increases in steel costs, curbed sales of new containers to some extent, causing greater interest in reconditioned drums and, in a lesser degree, in certain other types. Further, sheet steel supply was a problem with many drummakers throughout the greater part of the year, although currently supply is more than adequate.

Better in 1954—Most drummakers anticipate a better year in 1954. Consumer inventories of both new and reconditioned containers have been materially reduced; sheet steel supply should represent no difficulty; and certainly there are no indications of higher prices.

Annual production of the drum industry, with its some 70-odd plants, is valued currently at $250-million. Yearly capacity is estimated at 15 million light drums, 52.5 million heavy drums and 110 million packages and pails.

Distribution of drums is indicated by following 1952 figures:

	Drums 18 gauge & heavier	Drums 19 gauge & lighter	Drums 20 gauge & lighter
Food	7.1 %	0.8 %	4.7 %
Petroleum	43.6	53.3	24.4
Chemical	23.3	21.9	13.9
Paint and Varnish	5.5	2.5	30.5
Other	3.9	20.8	24.6
Armed Services direct	16.6	0.7	1.9

The Hunt for the New—Research is featured by the development of linings for additional "hard-to-pack" chemicals. Lined containers, in rather negligible quantity four years ago, now comprise approximately 25 per cent of the entire output of shipping containers.

Drum reconditioners look for this year to about equal the last, maybe slightly exceed it. And they anticipate a better year in 1954.

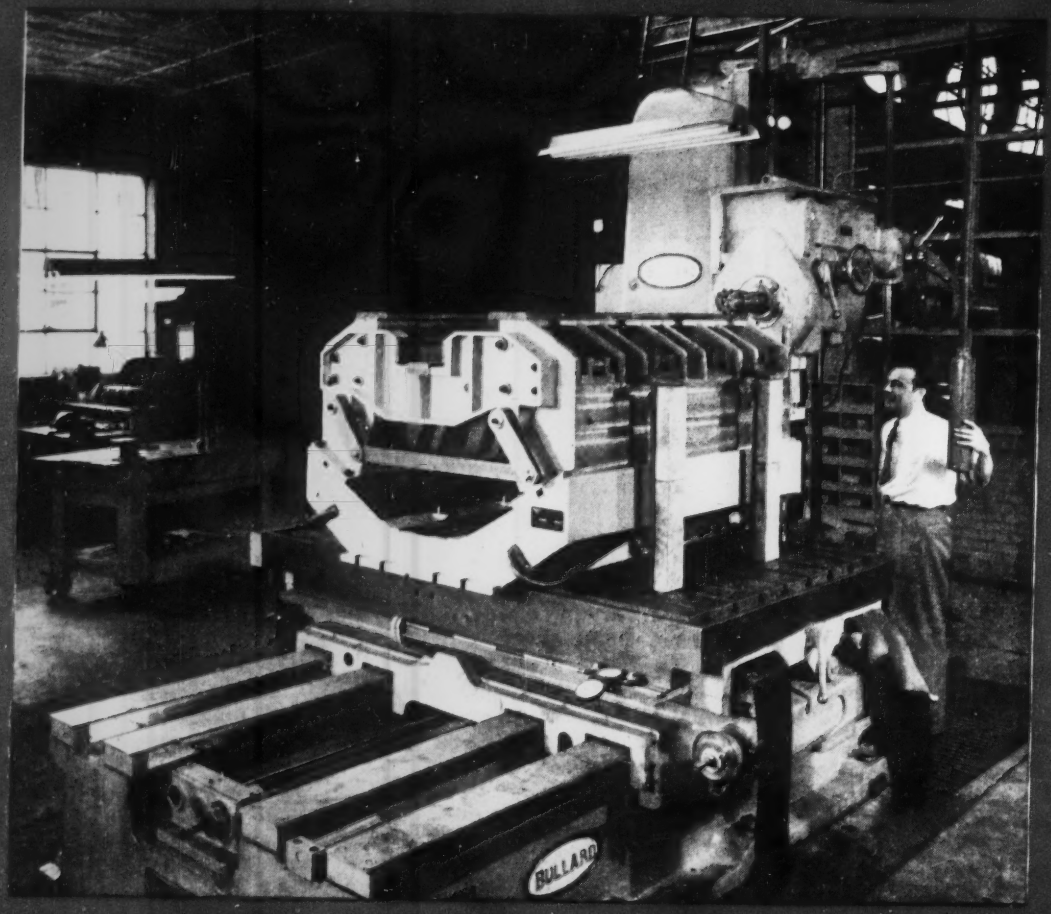
No Squeeze on Tubes—Collapsible tube industry comprising 20 plants, including three captive units is going to enjoy as good a year in 1953 as last year, when 6 million gross were produced.

It got off to a particularly good start the first half when operations were 15.2 per cent above the corresponding period of 1952, and when, except for food products, shipments of tubes for various end-uses increased from 7 per cent for dentifrices to 38.1 per cent for household and industrial purposes. The outlook for the new year is less promising, one industry leader doubting if shipments will exceed 5.5 million gross, as pipe lines are getting well filled.

Aluminum Again—Use of aluminum in the manufacture of collapsible tubes has increased rapidly over recent years from around 8 per cent of the metals used for this purpose just prior to World War II to about 43 per cent at present. Actually, as of last September, aluminum accounted for 42.89 per cent against 9.83 per cent for pure tin, 30.9 for pure lead, 13.58 for tin-lead and 2.8 for tin coated lead.

Contributing principally to the spurt in aluminum have been the prices and shortages of tin and lead during the national emergencies of the past decade or so. Indeed, facilities installed during critical periods for processing aluminum tubes (special presses and annealing equipment) account largely for substantial overcapacity in the industry, it is pointed out. However, application of aluminum appears to have definite limitations in this field. On the basis of present market research, 50 per cent represents about the maximum, one industry leader believes.

ENGINEERED BY BULLARD



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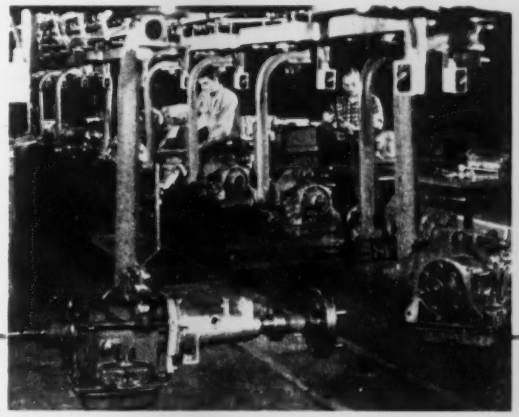
New PowerFlite Plant Is Precision Dream



DETROIT

CHRYSLER'S new PowerFlite torque-mixer is undeniably interesting stuff.

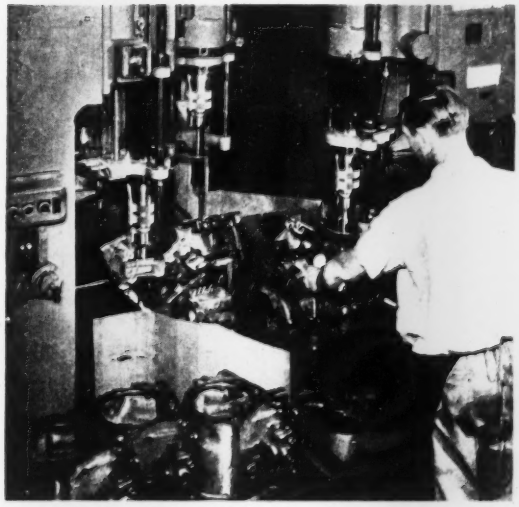
Providing top 4.47:1 breakaway leverage, high driver goof-resistance and notable simplicity, the PowerFlite comes from a plant near Indianapolis interesting for much the same qualities as its product. Being shown publicly for the first time today, the plant embodies high efficiency, rigid quality production controls and maximum simplicity of production equipment.

The Details—Poop-sheeted highlights of the plant include the facts that it was built in 1952, includes 650,000 square feet of manufacturing area, utilizes some 2900 pieces of equipment of which 1600 are production machine tools, contains 17 overhead conveyors totaling more than three miles in length and incorporates a total of more than 50 miles of pipe. Also there are more than 8000 fluorescent lights with two five-foot tubes in each light, all of which shed considerable illumination on the scope of the operation.

But to appreciate truly what goes on at the PowerFlite plant, you must understand that even the relatively simple PowerFlite transmission is a mighty complicated unit. Machine operations are performed on 24 different castings, 12 forgings, 4 stampings and 30 different steel bar pieces, which adds up to a lot of machining before you even get to assembly operations. Most parts require operations in several different departments before they are completed and must be held to exceedingly close tolerances to retain and control oil pressure reaching 250 psi when shifted into reverse gear.

Case in Point—A good example is the transmission case which arrives at the Indianapolis plant as a relatively conventional hunk of cast iron. Before machining can even begin, the castings must be annealed in a furnace and then cycled automatically through what is believed to be the largest installation of its type. Forty-five tons of Kolene salt are maintained at a temperature of 950 degrees F. When the castings are immersed in the bath, sand and scale are removed through a combination of electrolytic and chemical action at the rate of 96 castings per hour. About 2½ hours are required for a casting to complete the circuit, and 600 amps dc are supplied for the process. A second installation of the same type is being readied to supplement production.

Approximately 40 parts pass through heat treatment including gears, shafts and valves. Controlled atmospheres are maintained in all furnaces with many parts copper plated to prevent carbon penetration. Ranging up to 0.040 inch, the case is applied to such surfaces as gear teeth, shoulders and sliding valve sur-



Piston bores in the PowerFlite transmission case are lapped on this three-spindle hone in Chrysler's new plant at Indianapolis

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Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,228	595,715
October	651,153	656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Oct. 24	149,794	144,747
Oct. 31	145,311	155,037
Nov. 7	133,783	143,610
Nov. 14	115,748	146,825
Nov. 21	107,749	129,224
Nov. 28	95,000*	119,781

Source: Ward's Automotive Reports
*Estimated by STEEL

faces where high wear resistance is required. Of particular interest are a number of Gleason machines in which the hot reverse and kick-down annulus gears are held between dies and oil quenched, yielding a hardness of 58-60 Rockwell C with a tolerance of 0.002 inch over-all.

Notability — Another notable piece of equipment in the heat-treat department is a Thermonic induction heating rig which handles splined direct clutch housings in loads of three. Indexing eight times, the machine heats both sides of a like number of splines with each pass completing 180 parts per hour.

And one of the most harried parts to pass through the department is the oil pump drive sleeve which finds itself carburized, case hardened and finally selectively hardened by induction heating on the bearing surface.

Back to Case—But let's get back to the transmission case castings which get the plant's major machining treatment. Leaving heat treat, these parts eventually proceed down either of two duplicate lines where dozens of operations are performed before they emerge as finished transmission cases. Noteworthy in the setup are automated 22 and 19-station Barnes-dril equipment in each line and a battery of three-spindle Micromatic hones. The latter finish three servo-piston bores of different diameter to within 0.0005 inch roundness and concentricity with a surface finish of under 20 micro-inches r.m.s.

Also honed for good sealing characteristics and accurate hydraulic control are the bottom transmission case surface, oil pump gear side surfaces, transfer plates, regulator bodies, valve bodies, annulus gear bearing surfaces and governor bodies. The pinion gear bores are also honed on equipment with automatic loading and ejecting fixtures and feature automatic sizing to a tolerance of 0.0005 inch on bore diameter.

Strip to Hoop—Another interesting part is the clutch brake band formed into a hoop from strip steel with a forging butt-welded into place between the ends of the coil. Machining operations follow on the circular part after which the brake lining is cycle-welded into place on the inner surface. Utilized in the process is a Neyz machine which extrudes the cement onto the lining in the proper quantity automatically. Following oven drying, the band with its lining in place is put on a merry-go-round type gismo which applies heat and pressure to complete the bonding. Finally the bands are cut apart through the center of the forging ready for installation.

Assembly of the transmission is in the accepted subassembly build-up practice with the completed units subjected 100 per cent to performance testing and inspection on equipment specially built for the purpose.

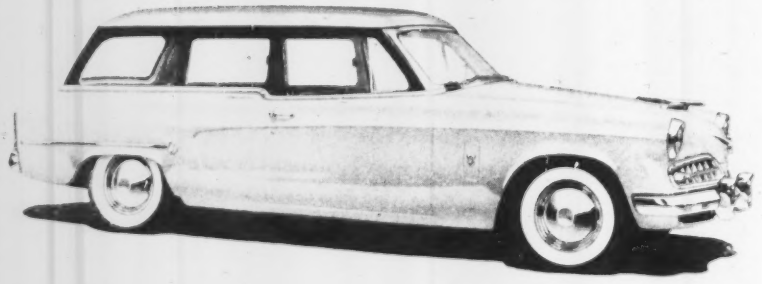
Road Tests, Too—At the present time a substantial percentage of production is also road-tested in cars as an added insurance of production quality. One car may have as many as 16 different transmissions per day, and if you've ever tried to pull a transmission you'd get a bang out of watching these boys change a transmission quicker than most motorists can change a tire.

Virtually each piece of equipment and operation at the PowerFlite transmission plant would make an interesting story in itself. Yet unmentioned are the use of gear speeders in inspection to be sure that the noise level of the transmission will be low and many other quality controls used at the plant. Yes, the PowerFlite plant embodies precision production that should interest the industry as much as its product.

Chevrolet Unveils Trucks

A new line of 1954 Chevrolet trucks was unveiled Nov. 28.

Major changes for next year's models include: Three new engines with increased horsepower; automatic transmissions optional through the one-ton model range; heavier axle shafts in the two-ton models, bigger clutches on light and heavy-duty models and more rigid frames on all models; appearance improvements with a new, more massive radiator grille and front-end design; modified body mountings on pickup, platform and stake models to permit more space and easier loading.



Wagon For Pushbutton Pioneers

1954 version of a famous wagon is Studebaker's all-steel Conestoga station wagon, available in DeLuxe and Regal models in both Champion and Commander

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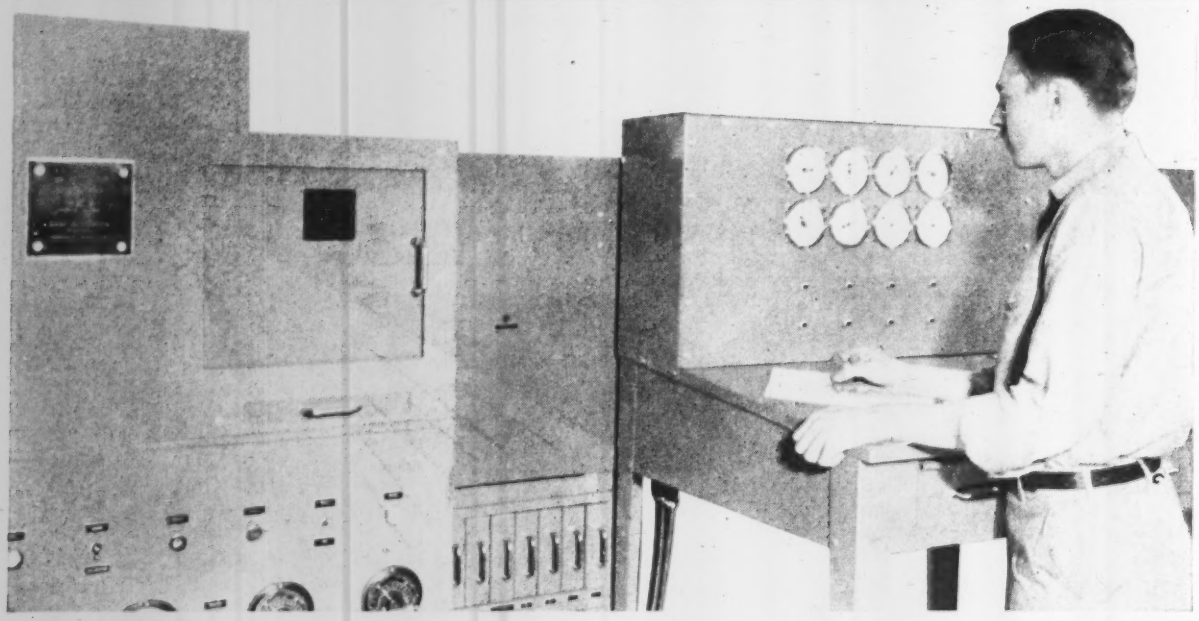

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YOU can be sure of uniform forgings when you use Timken forging steels. That's because the quality of Timken forging steels is rigidly controlled, from melt shop all the way through final inspection, by the most precise methods known.

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For help in improving the quality of your forgings and cutting production costs, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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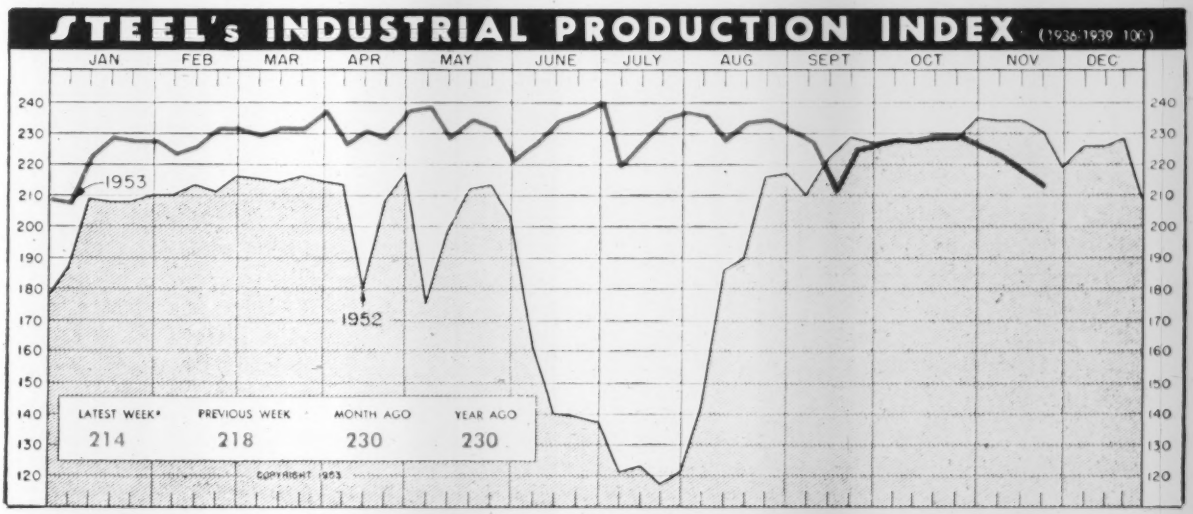


*Week ended Nov. 21 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%

Auto Changeovers, Holidays Hold Key to Production

EASING DEMAND in the steel industry and model changeovers in Detroit, along with the continuing decline in railroad car loadings, are again in evidence in STEEL's industrial production index which, in the week ended Nov. 21, descended four points from the preceding week's adjusted rate to an estimated 214 per cent of the 1936-1939 average.

The immediate future doesn't hold much promise of recuperation, either. Last week for the first time since the strike-recovery week of Aug. 11, 1952, the nation's steel production fell below the 2-million-ton mark. American Iron & Steel Institute estimates only 1,974,000 net tons of steel were poured for ingots and castings during Thanksgiving week. Not only were operations disrupted by the one-day holiday, but also a minor strike of the railroaders at Aliquippa, Pa., slowed production of Jones & Laughlin Steel Corp.

Too Many Changeovers . . .

Nor can much help be expected from the automakers in reviving business activity. Model changeovers can be expected off and on until well into 1954. The annual affair at Chevrolet and Buick caused U. S. auto output to slide to the 1953 low of 79,884 for the week ended Nov. 21, reports *Ward's Automotive Reports*. When those two get back into full production, some other make will go into the beauty parlor for a face-lifting job, and production will still be down. With U. S. truck production of 23,365 units and Canadian auto-truck output of 4500 units, total Canadian-U. S. automotive production came to 107,749, down from the previous week's total of 115,748.

However, such fluctuations at this time of the year are expected and planned. When the grand totals are all in, 1953 will still be the second biggest year in motordom history. Already total car and truck production has passed the second best production figure of 6,751,065 racked up in 1951.

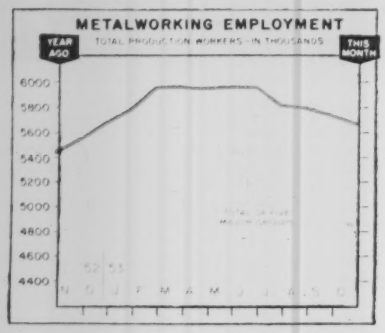
Car Loadings Still Lag . . .

Railroad car loadings of revenue freight continued to hold beneath 1951 and 1952 levels as only 727,058 cars were moved in the week ended Nov. 14, says Association of American Railroads. That was 12.3 per cent below the corresponding week in 1952 and 10.7 per cent below the 1951 figure. Nearly half of the 20,810-car decrease from the previous week, or 9957 cars, was accounted for by reduced ore loadings. Even at that, 1953, with 34,567,404 car loads, is ahead of 1952 but behind 1951.

Electric output is the one bright spot in STEEL's industrial production index, continuing its high flow at 8,457,342,000 kilowatt-hours for the week ended Nov. 14, or 7.3 per cent above the corresponding week of last year, says Edison Electric Institute.

Earnings Remain High . . .

Despite the lull in industrial activity, weekly earnings of factory workers have remained at near-record levels, according to the Bureau of Labor Statistics. The average weekly factory paycheck in mid-October was $71.73, compared with $70.38 a year before. The average workweek of 40.3 hours, while below the post-World War II average, was still high enough to indicate some scheduling of overtime work. Between Au-



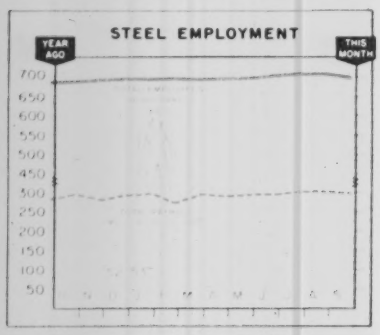
Metalworking Employment

In Thousands

Production Workers—Five Major Groups

	Prim. Mtls.	Fab. Prod.	Mach. inery	Elec. Mchy.	Trans. Equip.
1952					
Oct.	1,162	847	1,212	766	1,380
Nov.	1,173	863	1,242	784	1,421
Dec.	1,183	881	1,284	800	1,460
1953					
Jan.	1,188	891	1,289	804	1,484
Feb.	1,142	942	1,323	916	1,543
Mar.	1,145	952	1,335	926	1,574
Apr.	1,144	952	1,321	926	1,576
May	1,138	952	1,307	919	1,556
June	1,143	956	1,300	911	1,548
July	1,134	938	1,264	892	1,533
Aug.	1,131	950	1,236	903	1,523
Sept.	1,123	943	1,226	911	1,478
Oct.	1,108	933	1,214	897	1,464

U. S. Bureau of Labor Statistics

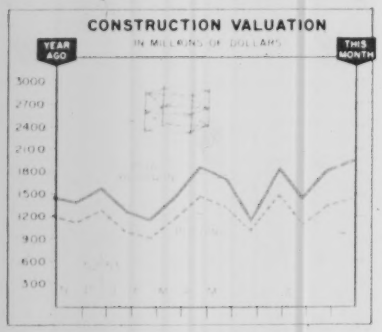


Steel Employment, Payrolls

	in Thousands		in Millions	
	1953	1952	1953	1952
Jan.	684	672	$285.4	$252.2
Feb.	685	674	261.3	234.9
Mar.	683	672	281.0	242.7
Apr.	685	670	278.0	225.6
May	685	662	281.0	223.1
June	690	*	282.1	*
July	696	*	288.1	*
Aug.	696	660	287.3	*250.4
Sept.	687	674	283.8	269.4
Oct.		677		282.9
Nov.		680		269.7
Dec.		684		280.0

*Not available because of steel strike.

American Iron & Steel Institute

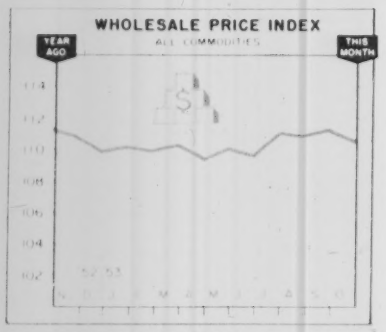


Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1953	1952	1953	1952
Jan.	1,075.9	902.1	867.0	695.4
Feb.	1,021.3	885.2	792.9	697.8
Mar.	1,347.5	1,321.3	1,054.4	1,056.0
Apr.	1,741.5	1,597.5	1,354.2	1,243.5
May	1,906.1	1,563.6	1,219.8	1,216.2
June	1,715.5	1,488.8	922.3	1,133.3
July	1,793.3	1,511.3	1,117.8	1,170.8
Aug.	1,414.4	1,438.7	1,053.4	1,147.5
Sept.	1,741.7	2,039.2	1,290.7	1,790.8
Oct.	1,862.4	1,316.1	1,392.7	1,072.8
Nov.		1,218.8		959.9
Dec.		1,467.4		1,117.7
Total		16,774.9		13,362.1

F. W. Dodge Corp.



Wholesale Price Index

(1947-1949 = 100)

	1953	1952	1951
Jan.	109.9	113.0	115.0
Feb.	109.6	112.6	116.5
Mar.	110.0	112.3	116.5
Apr.	109.4	111.8	116.3
May	109.8	111.6	115.9
June	109.5	111.3	115.1
July	110.9	111.8	114.2
Aug.	110.6	112.2	113.7
Sept.	111.0	111.7	113.4
Oct.	110.2	111.1	113.7
Nov.		110.7	113.6
Dec.		109.6	113.5

U. S. Bureau of Labor Statistics.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Oct. 12	Ironers	Nov. 23	Refrigerators	Nov. 2
Fab. Struc. Steel	Nov. 16	Machine Tools	Oct. 5	Steel Castings	Oct. 19
Foundry Equip.	Nov. 16	Malleable Castings	Oct. 19	Steel Forgings	Oct. 19
Freight Cars	Nov. 23	Prices, Consumer	Sept. 28	Steel Shipments	Oct. 12
Furnaces, Indus.	Sept. 14	Pumps	Nov. 16	Vacuum Cleaners	Oct. 12
Gears	Nov. 16	Radio, TV	Nov. 23	Wages, Metalwk.	Nov. 9
Gray Iron Castings	Oct. 19	Ranges, Elec.	Nov. 2	Washers	Nov. 9
Indus. Production	Nov. 23	Ranges, Gas	Oct. 12	Water Heaters	Nov. 9

gust and October, the hours declined, but they were still a half hour higher in the latter month than in September.

Stocking for Christmas . . .

Even though earnings were above year-ago levels, workers were spending proportionally less on TV sets and radios in September than in the preceding year. Radio-Electronics-Television Manufacturers Association reports 753,953 TV sets and 650,898 radios were sold that month, down from September, 1952, by 14 per cent and 27 per cent, respectively. Those figures are well above the August sales totals, however. Of significance is the fact that production and shipments are outdistancing sales. Production of TV sets and radios in September were 770,085 and 1,216,525, respectively, while shipments of the former to dealers were 816,529. Coming of the Christmas buying rush probably accounts for much of the stocks.

Gas Still Preferred . . .

Gas Appliance Manufacturers Association Inc. reports that shipments of gas-fired central heating equipment in October slipped to 94,200 units, or 6.1 per cent below the corresponding month last year. Production in September was 102,700 units. The Association also reports that estimated October shipments of domestic gas ranges were 215,800 units, 10,700 units below September and 10 per cent less than in October, 1952. But shipments for the first ten months of 1953 still are ahead of a like 1952 period by 4.8 per cent. GAMA figures show that gas ranges are still preferred over electric ranges by 1.6 to 1 as compared with 2 to 1 last year.

More Roofs Overhead . . .

In a period of declining activity, a production morale booster is housing starts, which, though down too, are not off as much as had been expected. Unusually good weather in September and October has resulted in 88,000 nonfarm housing starts in October, only about 4000 less than in September. On a seasonally adjusted

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	90.5	92.5	106.0
Electric Power Distributed (million kwhr)	8,500[1]	8,457	7,971
Bitum. Coal Output (daily av.—1000 tons)	1,467	1,470	1,757
Petroleum Production (daily av.—1000 bbls)	6,300[1]	6,219	6,663
Construction Volume (ENR—millions)	$244.7	$251.7	$269.9
Automobile, Truck Output (Ward's—units)	107,749	115,748	129,224
TRADE			
Freight Car Loadings (unit—1000 cars)	715[1]	727	811
Business Failures (Dun & Bradstreet, no.)	185[1]	155	167
Currency in Circulation (millions)[3]	$30,487	$30,540	$29,842
Dept. Store Sales (changes from year ago)[3]	+2%	+3%	+9%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,745	$15,115	$20,300
Federal Gross Debt (billions)	$275.0	$275.0	$265.1
Bond Volume, NYSE (millions)	$16.8	$14.9	$26.0
Stocks Sales, NYSE (thousands of shares)	6,720	5,718	9,602
Loans and Investments (billions)[4]	$80.5	$79.4	$77.0
U. S. Gov't Obligations Held (billions)[4]	$32.4	$31.7	$32.0
PRICES			
STEEL's Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	204.8	204.6	214.7
All Commodities[7]	109.8	109.9	110.7
Commodities Other Than Farm & Foods[7]	114.6	114.5	112.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,010. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

basis, private starts were at an annual rate of 1,006,000 for October, better than the August and September rates. The first-ten-months total for 1953 919,500 starts is the highest total for the period for any year except 1950.

Wholesale Prices Stable . . .

Wholesale prices for the week ended Nov. 10, remained at 109.9 per cent of the 1947-49 average, reports the Bureau of Labor Statistics. That was slightly below the October average and 0.7 per cent below November, 1952.

Cause for Alarm . . .

One of the most alarming trends of the year is the increase in business failures. While they fluctuate from week to week, October's 840 failures was the largest monthly toll since May, 1950, and the largest total for October since 1940.

Private Planes Go Up . . .

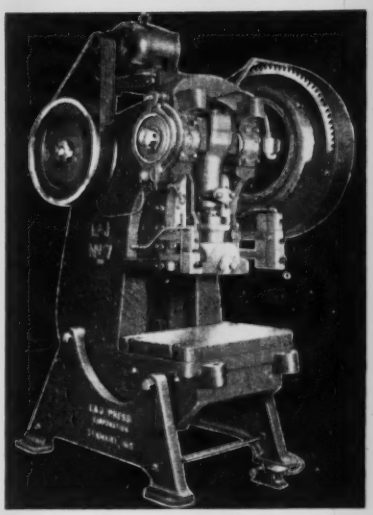
Following the trend of aircraft manufacturers to prepare themselves for days of less defense work, Civil Aeronautics Administration reports that shipments of complete civilian aircraft, as measured by airframe weight, amounted to 941,200 pounds in September, or 14 per cent above August shipments. The number of completed aircraft shipped from January to September, 1953, was 3374 compared with 2694 in the corresponding period last year.

Metal Cans Having Good Year

Even though September shipments of metal cans consumed only 485,561 tons of steel, 4 per cent below August shipments of 506,000 tons, cumulative shipments for the first nine months of 1953 are still 7 per cent above the corresponding period in 1952, says the Bureau of the Census. American Can Co., New York, reports its production for that period was 9.4 per cent over the same nine months of 1952.

Trends Fore and Aft . . .

President Eisenhower received the 50-millionth telephone from officials of American Telephone & Telegraph Co. recently . . . Value added by manufacture in New England during 1952 was $9 billion, an increase of 6 per cent over 1951, although employment increased less than 1 per cent.



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It will pay you to find out the advantages this 80 ton press has to offer. Also, 11 other back geared and plain flywheel models starting at 6 tons.

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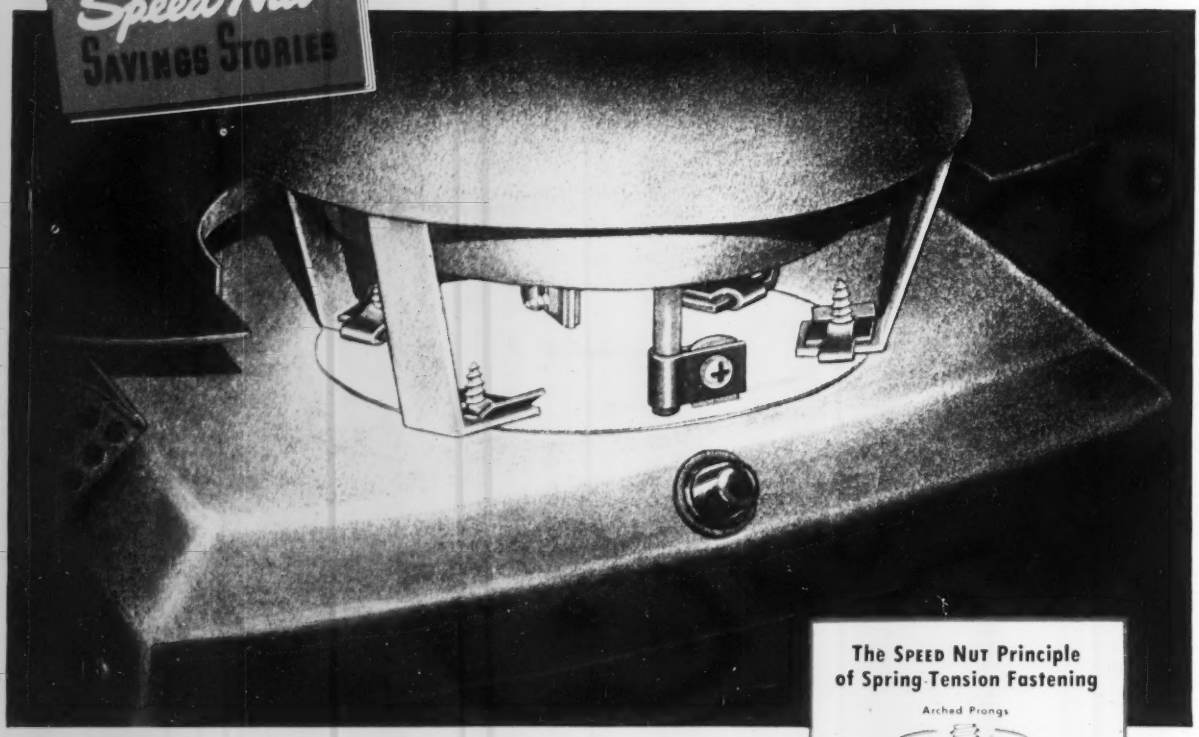
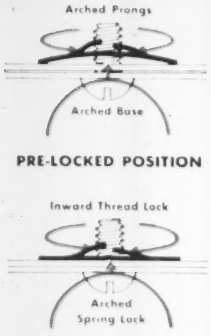


SPEED NUTS® make "RED HOT" 50% Savings for new VECTAIRE, jet-convector heater!

Another outstanding SPEED NUT example of profit-saving through cost-reduction! Federal Malleable Co., a newcomer in the heater field, selected SPEED NUT Brand Fasteners after carefully checking various attaching methods. The results over all other types considered was a 50% SPEED NUT assembly savings! Here are a few of the reasons: SPEED NUTS reduce material and handling costs, often saving as many as 4 parts per attachment; no special application skills are required; these spring steel fasteners snap in place by hand, are self-retaining in blind locations; costly welding, clinching or staking equipment is eliminated!

Six standard SPEED NUT types, 17 parts in all, solved Federal's problem: Flat type, Push-Ons, "J" & "U" types, Tubular Clips, and Tube Clamps. Contact your Tinnerman representative for detailed cost-saving information on your products.

The SPEED NUT Principle of Spring-Tension Fastening



Send for your "SAVINGS STORIES" booklet of interesting SPEED NUT savings to industry. Write today. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners, Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S.A., 7 rue Henri Barbusse, Levallois (Seine).

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MORE THAN 8000 SHAPES AND SIZES

RODNEY O. McSHERRY
Oliver Corp. chief engineer

JOHN A. MATOUSEK
Baker-Raulang v. p.-general manager

FRED E. GREGER
. . . sales mgr., Standard Steel Works

Oliver Corp., Chicago, appointed **Rodney O. McSherry** chief engineer and **John K. Tomko** assistant chief engineer. Mr. McSherry has served as chief experimental engineer, Mr. Tomko as senior product engineer.

D. R. Jones, chairman of the board of **Geometric Stamping Co.**, Cleveland, subsidiary of Barium Steel Corp., was elected president to succeed **J. A. Macmillan.** Mr. Macmillan will remain a director of the corporation. **E. F. Carney** was elected vice president-general manager. **Clarence W. Seik** becomes treasurer and secretary and **R. C. Barker** assistant in those positions.

John E. Rowe was appointed vice president in charge of industrial and public relations for **Binks Mfg. Co.**, Chicago.

George O. Bohrer was named chief engineer, **Magnesium Co. of America**, East Chicago, Ind. He has been an assistant plant manager of Continental Can Co. for the last three years. He now succeeds the late **V. J. Daniels.** **C. Ridgely Kemp**, vice president-production, was appointed to the newly created position of vice president in charge of research and development. He is succeeded in the production post by **William R. Davison**, formerly a vice president in charge of foundry operation.

Baker-Raulang Co., Cleveland, elected **John A. Matousek** vice president and general manager, and **Ernest R. Scovil** secretary and treasurer. Mr. Matousek, who joined the firm as manufacturing manager in 1949, has been vice president of manufacturing since October, 1951.

John H. Lamothe was elected vice president and general manager of **Wheeler Reflector Co.**, Boston. He succeeds **H. Alden Barnes** who relinquished those positions to assume duties of assistant to the president. **Charles D. Weston** was made vice president-sales and **Fulton A. Eldridge** vice president-production.

At **Dayton Malleable Iron Co.**, Dayton, O., **Keith Williams** and **L. J. Gallagher** were elected vice presidents. Mr. Williams is general manager of the firm's Pratt & Letchworth Division at Buffalo, and Mr. Gallagher is general manager of the Ironton, O., plant. **Frank O. Parker**, vice president and sales manager, was elected to the board of directors.

E. Fargo was appointed general sales manager for **Cleveland Industrial Tool Co. Inc.**, Cleveland. He was one of the original founders of the company during World War II and later retired to manage other business interests.

Fred E. Greger was named sales manager of **Baldwin-Lima-Hamilton Corp.'s** Standard Steel Works Division, Burnham, Pa. Since 1950 he has been in Chicago as western sales manager for the corporation's Hamilton Division.

Charles Locke, for the last two years works manager, Atlas Foundry & Machine Co., is now works manager at **West Michigan Steel Foundry Co.**, Muskegon, Mich. For ten years prior to 1948 he was with the latter company, advancing to chief metallurgist and later to general superintendent. From 1948 to 1951 he was in the metals research department of Armour Research Foundation, Illinois Institute of Technology.

Robert Shattuck was made president of **Borg-Warner Corp.'s** Marbon Corp., subsidiary at Gary, Ind. He succeeds **George P. F. Smith**, retired from that post to devote full time to duties as president of the Norge Division. **H. Hunter Gehlbach** becomes secretary of Marbon and **E. R. Meyer** treasurer and assistant secretary.

A. T. Peters, assistant plant superintendent, Bay City, Mich., division, **Dow Chemical Co.**, was named plant manager for the division.

C. A. Fike was made manager of manufacturing at the Cleveland

A. W. MORGAN
. . . Pachmayr Gun Works exec. v. p.

NELSON S. TALBOTT
. . . position at Harris-Seybold

JAMES F. BRINKERHOFF
. . . factory mgr. of Argus Cameras

plant of **Westinghouse Electric Corp.'s** lighting division.

A. W. Morgan was appointed executive vice president and general manager of **Pachmayr Gun Works Inc.**, Los Angeles. He was formerly general manufacturing manager, San Diego, Calif., division, Consolidated Vultee Aircraft Corp.

Joseph Lind, formerly with Carbomatic Corp., opened an office for **Burdett Mfg. Co.**, Chicago, at 53 Park Place, New York. He will represent the company in metropolitan New York and in Connecticut and New Jersey.

Earl D. Hilburn joins the headquarters staff of **Westinghouse Air Brake Co.** in the newly created office of vice president, government contract service. For the last five years he has been director of engineering services for Melpar Inc.

O'Neal Steel Co. established offices in Chattanooga, Tenn., and Atlanta. **R. B. Freeman** is in charge of the Atlanta office and **Tom Brown** of the Chattanooga office.

Frank F. Mulkey was appointed manager of the St. Louis office of **Falk Corp.**, Milwaukee. He succeeds the late **Fitch Bosworth.**

Stanley L. Martin was appointed field engineer for **Republic Rubber Division,** Lee Rubber & Tire Corp., with headquarters in Houston. He has been with Republic in the home offices in Youngstown since July, 1952.

Nelson S. Talbott, assistant to the chairman of **Harris-Seybold Co.**, Cleveland, now fills the newly created position of director of industrial development. **Joseph W. Powell Jr.** was elected vice president for finance.

Automatic Screw Machine Products Co., Chicago, promoted **Alfred P. Lavery** to sales manager.

Firth Sterling Inc., Pittsburgh, elected **T. G. Barnes** vice president-sales and **J. T. O'Brien** vice president-operations. Mr. Barnes has been general manager of sales, and Mr. O'Brien has been works manager in charge of all company operations.

James F. Brinkerhoff was promoted from director of industrial relations to factory manager at **Argus Cameras Inc.**, Ann Arbor, Mich. He joined Argus in 1951 as assistant to the president.

Dr. Frederick A. Hessel joined the commercial development department, **General Aniline & Film Corp.**, New York, as commercial research manager. He had previously been president of Montclair Research Corp.

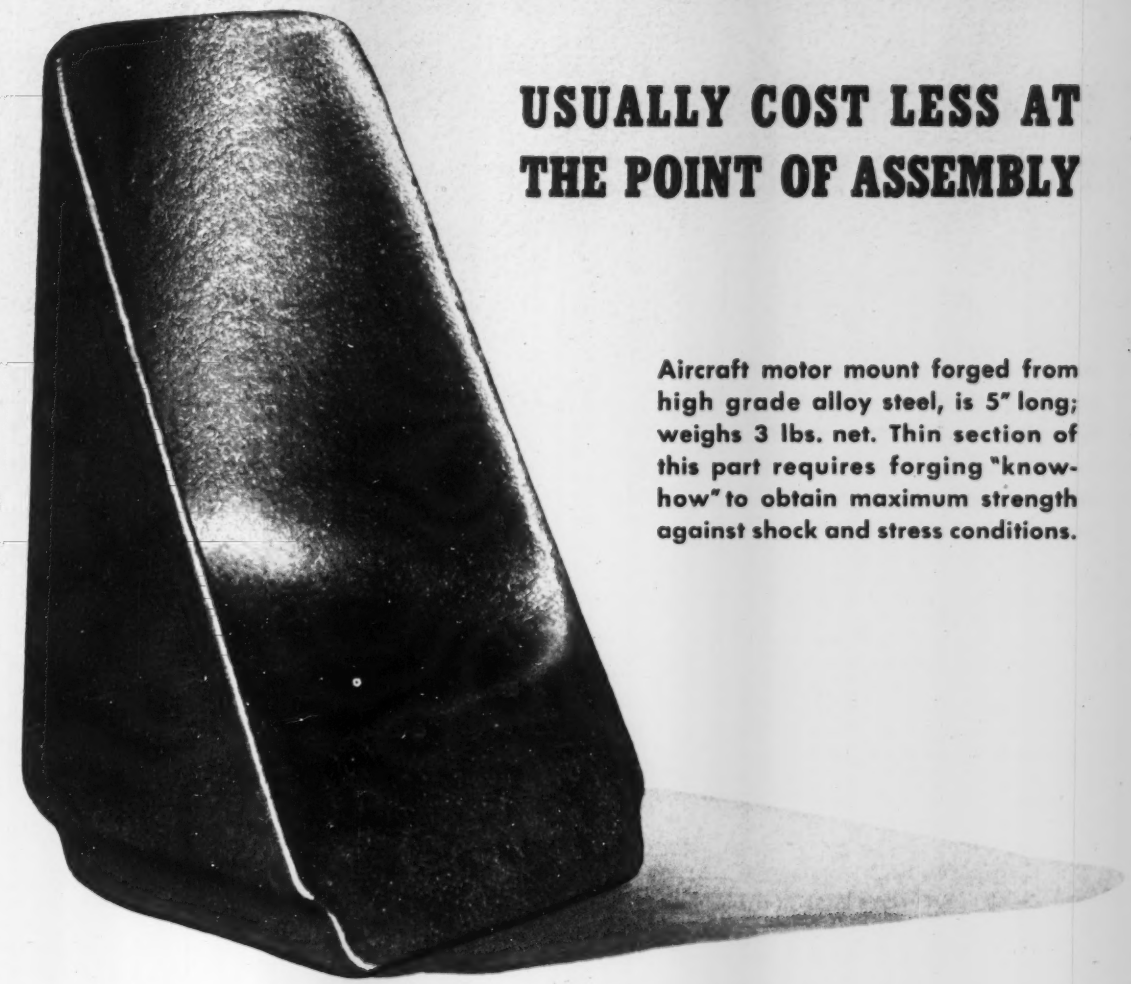
Richard A. Meck joined the Multi-Vent division of **Pyle-National Co.**, Chicago. Formerly planning production and design engineer for Victor Adding Machine Co., he was

T. G. BARNES

J. T. O'BRIEN

. . . new vice presidents of Firth Sterling Inc.

TRANSUE FORGINGS



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H. B. VAN AUKEN
. . . asst. chief engineer at Lempco

THOMAS A. JOHNSON
. . . supervises abrasive sales at Elgin

KENNETH L. WALKER
. . . supt. at Foster Wheeler's new plant

a sales engineer and design engineer with Pyle's Multi-Vent division from 1947 to 1950.

H. B. Van Auken was made assistant chief engineer at **Lempco Products Inc.**, Bedford, O. **Frank Vasarhely** was made chief tool engineer.

T. Richard Connors and **Charles S. Metro** were added to the sales staff of **Hamblin & Russell Inc.**, Lyndhurst, N. J.

Sydney E. Gregory was made Illinois and Indiana sales representative for **Alloy Precision Castings Co.**, Cleveland. He was previously general manager of the permanent mold division of Barnes Mfg. Co. and sales manager of Pressco Casting & Mfg. Corp.

Phil Powell will serve as sales representative for **Wolverine Tube Division**, Calumet & Hecla Inc. He will have headquarters in the southwestern district office, Houston.

Thomas A. Johnson, a division field engineer in northern Ohio since 1952, was appointed supervisor of sales for the abrasives division of **Elgin National Watch Co.**, Elgin, Ill.

Tower Iron Works, Providence, R. I., has added **Robert C. Lawrence** to its engineering and estimating department as a structural engineer.

Frank A. Roberts is manager of organization planning, a new unit in the industrial relations department of **Youngstown Sheet & Tube Co.**, Youngstown.

Erie Foundry Co., Erie, Pa., has added **Carl Hammon** to its engineering staff, hydraulic press division. He was formerly with Watson-Stillman Co. for 18 years.

Standard Transformer Co., Warren, O., appointed **H. W. Petty** sales representative for the western portion of Pennsylvania.

Kenneth L. Walker was named superintendent of the new Mountaintop, Pa., plant of **Foster Wheeler Corp.** He formerly served as superintendent of the boiler shop at the corporation's Carteret plant.

Stanley G. Harris was made general supervisor of costs and statistics, **American Steel & Wire Division**, U. S. Steel Corp. He transfers to division headquarters at Cleveland from Waukegan, Ill., where he served as chief accountant, Cyclone fence department. He assumes duties handled by **John W. Jordan**, now in Pittsburgh serving as assistant to executive vice president-accounting.

Arthur E. MacNall was made Detroit district sales manager for **Tinnerman Products Inc.**, Cleveland.

J. C. Hoff joined **Kawecki Chemical Co.**, Boyertown, Pa., as sales representative in Indiana, Michigan, Ohio, Illinois and Wisconsin. He has headquarters in Detroit.

OBITUARIES . . .

Howard A. Schlieder, 55, general purchasing agent, **Revere Copper & Brass Inc.**, New York, died Nov. 15.

Fred A. Tobitt Sr., 71, associated with **Armco Steel Corp.**, Middletown, O., for many years, died Nov. 17.

Glen H. Matthews, 62, sales manager, metalworking machinery, **Mattison Machine Works**, Rockford, Ill., died Nov. 14.

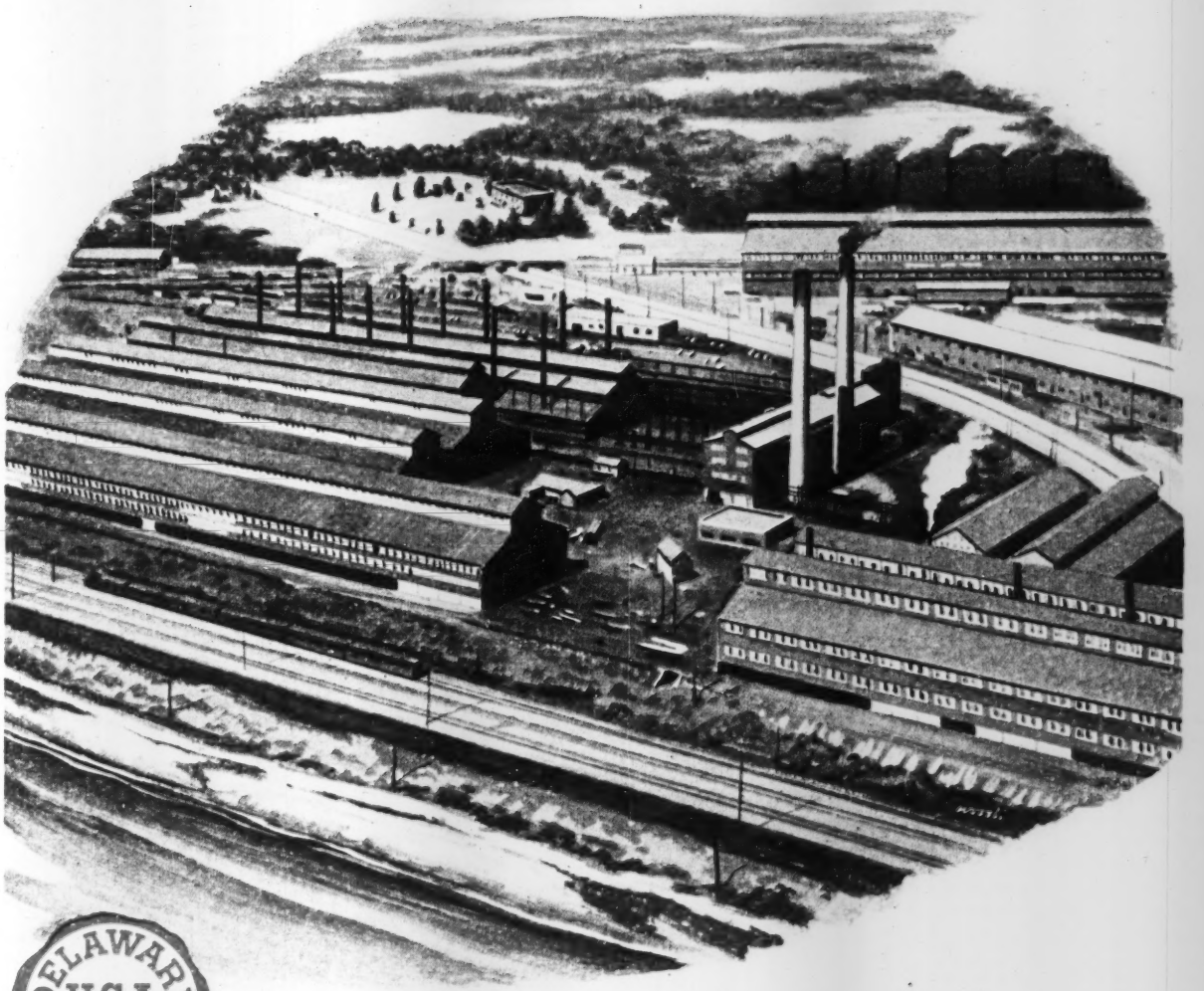
Chester M. Adams, 47, general sales manager, **Bridgeport Brass Co.**, Bridgeport, Conn., died Nov. 12.

Charles I. Longenecker, 78, a former mechanical engineer for **Chain Belt Co.**, Milwaukee, died Nov. 12.

Vernon R. Hill, superintendent, cold rolling and annealing and pickling departments, **Washington Steel Corp.**, Washington, Pa., died Nov. 12.

Arthur Cappelle, 49, assistant chief engineer, **Scully-Jones & Co.**, Chicago, died Nov. 16.

E. G. Fauntleroy, 61, director and vice president of **Moline Malleable Iron Co.**, St. Charles, Ill., died Nov. 17.



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Here at Claymont, in the fast-expanding industrial empire on the Delaware River, are the open hearths, rolling mills, flanging shops, and pipe mill that turn out a wide variety of Claymont Products.

These include Alloy and Carbon Steel Plates . . . Stainless-Clad Plates . . . Flanged and Dished Heads . . . Manhole Fittings and Covers . . . and Large Diameter Welded Steel Pipe for transmission of oil, gas or water.

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THE COLORADO FUEL AND IRON CORPORATION
CLAYMONT, DELAWARE

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Beardsley & Piper marketing line of shell molding machines and supplementary equipment

AN ADVANCED line of machinery for shell molding was placed on the market by Pettibone Mulliken Corp.'s Beardsley & Piper Division, Chicago.

This new line of automatic and semiautomatic shell mold equipment was engineered and developed by Beardsley & Piper in co-operation with Shell Mold Division, Winter Engineering Co., Buffalo. Shell Mold Division will be associated with Beardsley & Piper in the future development and sale of shell molding machinery and services.

Head Division—Otto W. Winter, president of Winter Engineering Co., will head Beardsley & Piper's new Shell Mold Division.

A complete line of single and multiple pattern shell mold machines and supplementary equipment will be offered. Consultation on shell molding problems also will be available through Beardsley & Piper's office at 2424 N. Cicero Ave., Chicago 39. Engineering facilities and a complete shell mold laboratory will be maintained.

Forms Ferro Powdered Metals

Ferro Corp., Cleveland, formed a wholly owned subsidiary, Ferro Powdered Metals Inc., Salem, Ind. Ferro entered the powdered metals industry last year through acquisition of Wel-Met Co. and since that time has consolidated operations of this division into improved facilities at Salem.

Char-Gale Moves Plant

Char-Gale Mfg. Co. moved its executive offices, factory and warehouse to Anoka, Minn. The company makes air conditioning fittings.

Meldon Steel Plans Branch

Meldon Steel Co., Brooklyn, N. Y., warehouse concern, will establish an upstate operating base in Syracuse, N. Y. The firm has executed a long-term lease providing for occupancy of a building of 16,000 sq ft. The facilities will include crane equipment. Terms call for the builder to provide up to 16,000 sq ft additional space at any time during the life of the lease.

Cleveland Scrap Firms Merge

Paramount Steel Inc. and Lederer Iron & Steel Co., both of Cleveland, merged, forming Lederer Iron & Steel Co. with offices at 9515 Woodland Ave., that city. Executive personnel of both companies will integrate their respective responsibilities for the administration of the firm's scrap handling facilities.

Brust Tool Opens Plant

To provide expanded facilities for the design and development of production tools, Brust Tool Mfg. Co., Franklin Park, Ill., opened a new plant in that Chicago suburb. The company's expanded service includes design and engineering; special custom-built high-production machinery; tools and dies; and a production service on precision parts and products.

Appoints Machine Tool Agent

Hanson-Whitney Division, Whitney Chain Co., Hartford, Conn., appointed Giebel Inc., New York, as sales representative for its machine tools in that territory.

Chiksan Increases Production

Production has started in the 28,400-sq-ft addition to Chiksan Co.'s plant, in Brea, Calif. This will permit expanded manufacture of ball-bearing swivel joints and all-metal hose. H. J. Hagn, president, says that addition expands the plant and office area by 25 per cent.

Superior Tube Invests Abroad

Superior Tube Co., Norristown, Pa., purchased a controlling interest in Fine Tubes Ltd., Surbiton, Surrey, England, a large producer of seamless nickel cathodes and other electronic parts. Malcolm A. Rowe, who has been managing director of Fine Tubes for several years, will continue to serve the company in that capacity.

United Press

Cold Comfort

This deluge of home thermostats, a sure sign of winter's approach, is coming off the production line at Minneapolis-Honeywell Regulator Co.'s plant in Minneapolis. This round type regulator is the first radical change in design in over 70 years

Inland Steel Orders Furnaces

Two batteries of soaking pit furnaces of an improved design will be built by Salem-Brosius Inc., Pittsburgh, for Inland Steel Co., Chicago. Each battery will consist of three individual "holes," or furnace chambers, and will be used to reheat steel ingots in Inland's blooming mill and subsequent finishing mills.

The individual pits will be 21 ft long, 8½ ft wide and 12 ft deep. They will be equipped with Thermal Transfer Corp. metallic needle type recuperators to preheat air used in combustion to reduce the amount of fuel required. Each of the six end-fired pits will be equipped with one of these recuperator units.

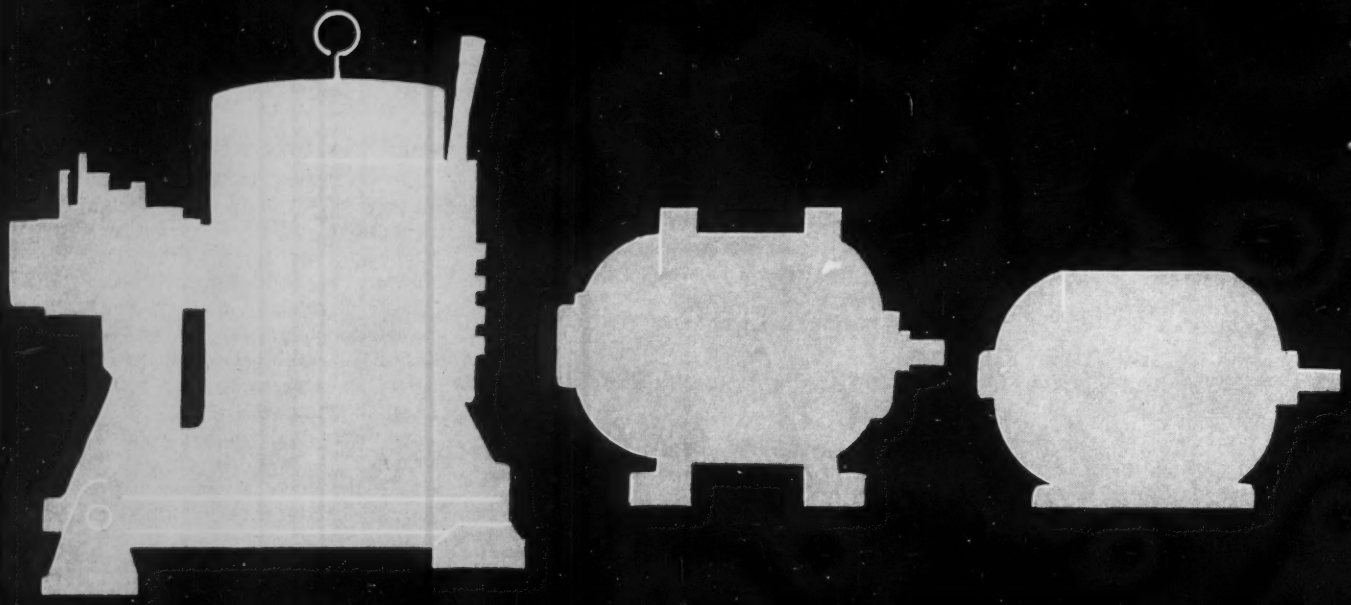
Dorman Tool Opens Offices

Dorman Tool Co. opened offices at 11 Julian Pl., Elizabeth, N. J. The company is a distributor of drill heads, drilling and tapping machines, drill press feeds and automatic reversing motors. Dorman plans to take on a few other

(*Please Turn to Page 86*)

WHAT'S NEW

IN MOTORS



1888
TESLA
5 H.P.
765 LBS.

1926
CS
5 H.P.
130 LBS.

1947
LIFE-LINE
5 H.P.
119 LBS.

IS STILL TO COME . . .

Hear anything about a new motor? Well, if you think you have, let's set the record straight . . . What's New In Motors Is Still To Come!

Westinghouse has been a leader in the designing and manufacturing of motors for over 60 years. During these many years, over 20 million dollars has been spent on the development of basic lines of induction motors to maintain this leadership. Here are the real years of "new motors" in the parade of progress:

1888—*THE FIRST A-C MOTOR—THE WESTINGHOUSE TESLA MOTOR*

1926—*THE FIRST SEALED SLEEVE BEARINGS—THE WESTINGHOUSE CS MOTOR*

1947—*THE FIRST MOTOR WITH PRE-LUBRICATED BEARINGS PLUS A ⅓ WEIGHT AND SIZE REDUCTION—THE WESTINGHOUSE LIFE-LINE MOTOR*

The smaller, lighter Westinghouse Life-Line Motor of 1947 was the last major contribution. *AND FOR THE NEXT ALL-IMPORTANT STEP AHEAD IN MOTOR PROGRESS . . . LOOK TO WESTINGHOUSE.*

YOU CAN BE SURE.. IF IT'S Westinghouse

J-21834

(Continued from Page 83)
items related to the tooling of drilling and tapping machines.

Plans Aircraft Tubing Mill

A $10.5-million naval industrial facility for the production of aircraft tubing is being built at Wallington, N. J., reports the Navy and Tube Reducing Corp., that city. The plant, scheduled for completion in 1954, will contain 96,000 sq ft.

Doepke Completes Project

Charles William Doepke Mfg. Co., Rossmoyne, O., completed a research and engineering building. The company makes model toys and materials handling equipment.

Will Sell Five Freighters

Pittsburgh Steamship Division, United States Steel Corp., plans to sell the five smallest ships in its 64-vessel fleet "in the interests of operating economy." The five vessels are known as Class C ships and range in length from 461 to 490 ft with an average cargo capacity of 7400 gross tons at maximum draft. The single-screw freighters are: *Gen. Orlando M. Poe, Samuel F. B. Morse, Cornell, Malietoa,* and *Robert W. E. Bunsen.* Bids will be accepted at the firm's Cleveland office until Mar. 1, 1954.

Globe Steel Opens Warehouse

Globe Steel & Supply Co., Los Angeles, opened a warehouse to stock sheet, coil, bar and tube in steel, aluminum, copper and stainless steel. Manager is S. P. Goldbaum.

Templeton, Kenly & Co. Move

Templeton, Kenly & Co. moved into their new plant in Broadview, Ill., a suburb of Chicago. The move to larger quarters was dictated by the development of new products, particularly hydraulic jacks and pullers.

A-C Distributors Appointed

Allis-Chalmers Mfg. Co., Milwaukee, appointed Lubbock Electric Co., Lubbock, Tex., as distributor for its motors and controls. The company also appointed Electric Supply Co. Inc., Wichita, Kans., as distributor for its motors, controls and transformers.

Beryllium Corp. Opens Branch

A district sales office to serve users of beryllium alloy wrought products and casting materials in the Chicago and Milwaukee areas was opened at 205 W. Wacker Drive, Chicago, by Beryllium Corp., Reading, Pa. District representative in charge is Paul J. Aicher Jr. The new setup supplements facilities of the company's warehouser and distributor, Guardian Metal Sales, 1911-15 N. Clybourn Ave., Chicago.

Pennsylvania Peerless Formed

Pennsylvania Peerless Corp., a recently-organized company, opened its plant in Pottsville, Pa., where it will manufacture special production equipment. Several of the organizers were key men in Peerless Production Co., Detroit, which has been making Peerless production equipment for the last 12 years and which will maintain its present operations. Products include all types of boring, drilling, tapping, chamfering, reaming and milling machines. Sales and engineering for both Peerless companies will be handled in Detroit at 19449 Glendale Ave.

Acme Reviews Developments

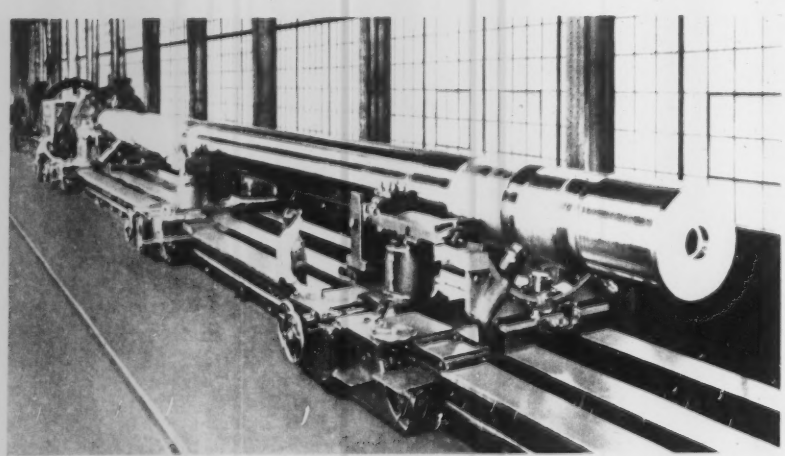
Confab, Acme Steel Co.'s recently issued quarterly publication, carries illustrated descriptions of the latest cost-saving applications of steel strapping and wire stitching. The firm's new advanced box stitching method also is explained. In addition, the publication features an editorial by Fred M. Gillies, president of the Chicago firm, in which he points out how careless freight car unloading costs the railroads millions of dollars annually.

Reynolds Names Representative

Reynolds Metals Co., Louisville, appointed Apex Steel Corp., Los Angeles, as jobber-erector of industrial building products for Los Angeles, Orange, Riverside and San Bernardino counties, California.

Steep Rock To Boost Output

Deep diamond drilling has hit high-grade iron ore nearly half a mile below the outcrop surface of the Errington orebody of Steep Rock Iron Mines Ltd., Atikokan, Ont. The Errington underground workings are in ore on three levels and will be ready for volume production at year-end. The shaft has



Mesta Turns Forging to Thing of Beauty

This column is one of eight to be used in a 50,000-ton hydraulic die forging press being constructed by Mesta Machine Co., Pittsburgh. Each column, forged from an ingot weighing over 500,000 lb, is about 76 ft long. It is being machined on a 96-in. turning and boring lathe to a diameter of 40 in. Before finishing, a 10-in. diameter hole was bored through entire length by trepanning

CHEMICALS ACP PROCESSES

PHOSPHATE COATINGS TO MAKE YOUR PRODUCT DURABLE*

PIONEERING RESEARCH AND DEVELOPMENT SINCE 1914

For more than a third of a century, ACP research chemists and ACP technical representatives in the field have pioneered in the science of metal preservation. They have developed surface treating chemicals which either protect metals directly, or create a superior bond for decorative and protective paint finishes, and now, ACP chemicals and processes are being used the world around to reduce costs, speed production and add to the life-span of countless products.

ACP metal protective chemicals include: protective coating chemicals for steel, zinc and aluminum; metal cleaners and rust removers; final rinse controls; pickling acid inhibitors; copper coating chemicals; soldering fluxes; alkali cleaners and addition agents; copper stripping and brightening solutions.

PAINT BONDING

"GRANODINE"® zinc phosphate coatings improve paint adhesion on automobiles, refrigerators, projectiles, rockets, and many other steel and iron fabricated units or components.

"LITHOFORM"® zinc phosphate coatings, make paint stick to galvanized iron and other zinc and cadmium surfaces.

"ALODINE"® protective coatings provide improved paint adhesion and high corrosion-resistance for aircraft and aircraft parts, awnings, wall tile, signs, bazookas, and many other products made of aluminum.

RUST PROOFING

"PERMADINE"® zinc phosphate coatings provide rust and corrosion proofing for nuts, bolts, screws, hardware, tools, guns, cartridge clips, and many other industrial and ordnance items.

PROTECTION FOR FRICTION SURFACES

"THERMOIL GRANODINE"® manganese-iron phosphate coatings provide both rust proofing and wear resistance — anti-galling, safe break-in, friction on rubbing parts.

IMPROVED DRAWING AND COLD FORMING

"GRANODRAW"® zinc phosphate coatings make possible improved drawing, cold forming and extrusion on such steel products as sheets for stamping, bumpers, parts to be formed, prior to plating or painting, cartridge cases, etc.

Made, Sold, and Serviced By A Pioneer In Protective Coatings For Metals . . .

AMERICAN CHEMICAL PAINT COMPANY

***General Offices:* Ambler, Penna.**

Detroit, Michigan — *Niles, California* — *Windsor, Ontario*

been taken to a depth of 1250 ft. Production from a new open-pit mine on the Hogarth orebody has been running more than 10,000 tons daily.

Lintern Names Representative

Lintern - Jolene Sales Corp., Painesville, O., appointed George Q. MacNamara Co., Detroit, as sales agent for crane cab and pulpit air conditioning units, safety and signal lanterns and traction sanders for overhead cranes. These products are made by Lintern Corp., Painesville.

General Pipe Opens Warehouse

General Pipe & Supply Co., Compton, Calif., steel distributor, moved into a new 80,000-sq-ft warehouse in South Compton, Calif. The firm stocks structural shapes, hot-rolled plates, sheets, flats, rounds and squares and bar shapes. Albert Levinson is president.

Lefton Forms New Division

Lefton Iron & Metal Co., St. Louis, organized International Rubber & Plastics Co. which will be operated as a division. The firm enters the scrap plastics and rubber field and sets up this business at 521-23 Spruce St., that city, where the firm has an office, plant and warehouse facilities. General offices are at 212 Victor St.

Moves by Remote Control

This electric powered truck, built by Automatic Transportation Co., Chicago, speeds materials handling. By standing on a platform behind the skid and operating remote controls, the driver raises or lowers himself and a 3000-lb load to the proper height

Oliver Corp. Buys Factory

Oliver Corp., Chicago, purchased the factory at Shelbyville, Ill., which it has leased for the last ten years and in which it manufactures hay balers, mowers and other farm equipment.

Frustrated Piles

STEEL PILES are being driven for a Chicago skyscraper that never will be erected. It is part of a test project being performed for U. S. Steel Corp., Pittsburgh, by Armour Research Foundation of Illinois Institute of Technology, Chicago.

Nine H-beam steel piles of three different sizes will be driven into the ground to various depths at a site near Halsted and Harrison streets, Chicago. Here, with the use of specially designed equipment, the steel piles will be loaded to the point of collapse. Each pile will be subjected to loads up to 800 tons, or the equivalent of 20 loaded freight cars.

Electronic instruments will gage the amount of strain. This record will serve to determine the capabilities of H-beam steel piles for use in the Chicago "Loop" area as point bearing piles.

Instrument Plant Opens

Fischer & Porter (Canada) Ltd., Toronto, Ont., affiliated with Fischer & Porter Co., Hatboro, Pa., finished erection of a factory with 11,800 sq ft of floor space. The plant will turn out a wide range of flow-rate indicators and other process control instruments.

Zirconium Corp. Organized

Zirconium Corp. of America was organized with general offices located in Solon, O. George R. Sylvester, president, says the firm plans to manufacture various zirconium compounds and will concentrate on production of zirconium oxide. The patented process to be used was developed by Sylvester & Co., Cleveland engineering firm, under the direction of Dr. R. A. Schoenlaub, vice president of Zirconium Corp. Guthrie Bicknell is vice president; Norton V. Coyle, secretary.

Fabricator Opens New Plant

Universal Metal Fabricators Inc., Saginaw, Mich., is moving into its plant at 306 Stoker Dr., that city. This plant almost doubles in size the one which was destroyed by fire last summer. The company is increasing production of milk coolers, wash tanks, grain elevator stands, plus several other products.

Dayton Pump Expanding

Dayton Pump & Mfg. Co., Dayton, O., announces further expansion of plant facilities. The firm plans to install a new assembly line for the production of water systems and to double its tank-making and galvanizing capacity. A new galvanizing kettle will have an automatic conveyor system.

Forge Works Changes Hands

A. E. Hansen, manager of Young Iron Works, Seattle, announced acquisition of Timberline Forge Works, Eugene, Oreg. The new owner plans improved facilities for producing and servicing logging equipment, industrial forged products, blocks, tools, etc.

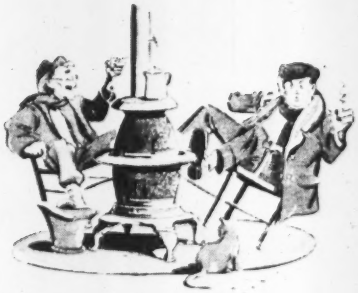
Gladden Names Representative

Gladden Products Corp., Glendale, Calif., manufacturer of aircraft hydraulics, pneumatics and fuel systems, appointed Reciputi & Weiss Inc., New York, as its eastern reprsentative.

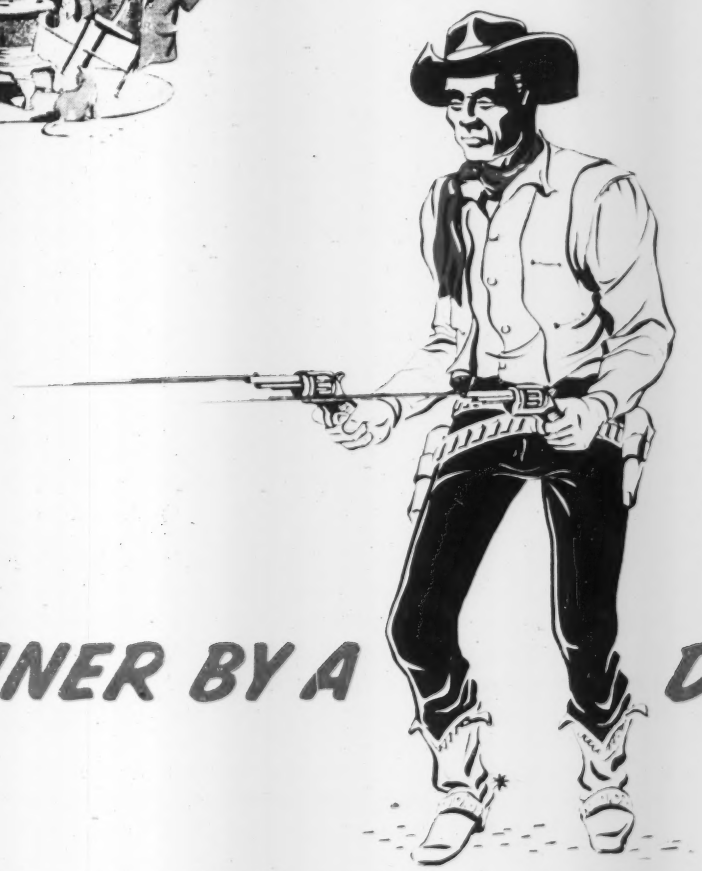
Dravo Gets McLouth Contract

Dravo Corp., Pittsburgh, will furnish and erect facilities for new boilers and turboblowers, two 12-ton ore bridges and a river dock for McLouth Steel Corp., Detroit. A multimillion-dollar "package" contract also includes fabrication and erection of plant piping and furnishing pumps for main mill water supply and a 4000-kw generator unit. These facilities will be built at the steel company's Trenton, Mich., Works in connection

(*Please Turn to Page* 91)



THE BURLINGTON LIARS' CLUB
SPINS A YARN FOR BAKER'S MAGDOLITE



WINNER BY A DRAW!

Two-Gun Smith, a fellow who lived down in Texas, was the fastest man on the draw that ever lived. One day he walked into one of those high-toned saloons in El Paso, where they had a full-length mirror hanging at the end of the bar. When Two-Gun saw himself in the glass, he figured such an ornery looking cuss might be looking for trouble, so he eased his hands a mite toward his shootin' irons. Naturally, the hard looking hombre in the mirror did the same. That was enough for Two-Gun. He shucked his hawg laigs and started shootin'—and he was so fast that he beat himself to the draw!

Two-Gun Smith was a man of quick but calculated decisions . . . you might say that he aimed *before* he drew. If he was working for your company, you could bet your bottom dollar he wouldn't fool around when it cume time to order dolomite. In that split-second when his hand was poised over his 'phone, his trigger-like mind would be comparing the chemical, physical, and mineralogical properties of all dolomites. And then, moving with the speed of an uncoiling rattler, he'd grab the 'phone and beller: "Send me a carload of BAKER'S MAGDOLITE—the original dad-burned (he means dead-burned) dolomite. It's always 5 ways better . . .Composition, Preparation, Strength, Economy, and Quality!"

JEBCO

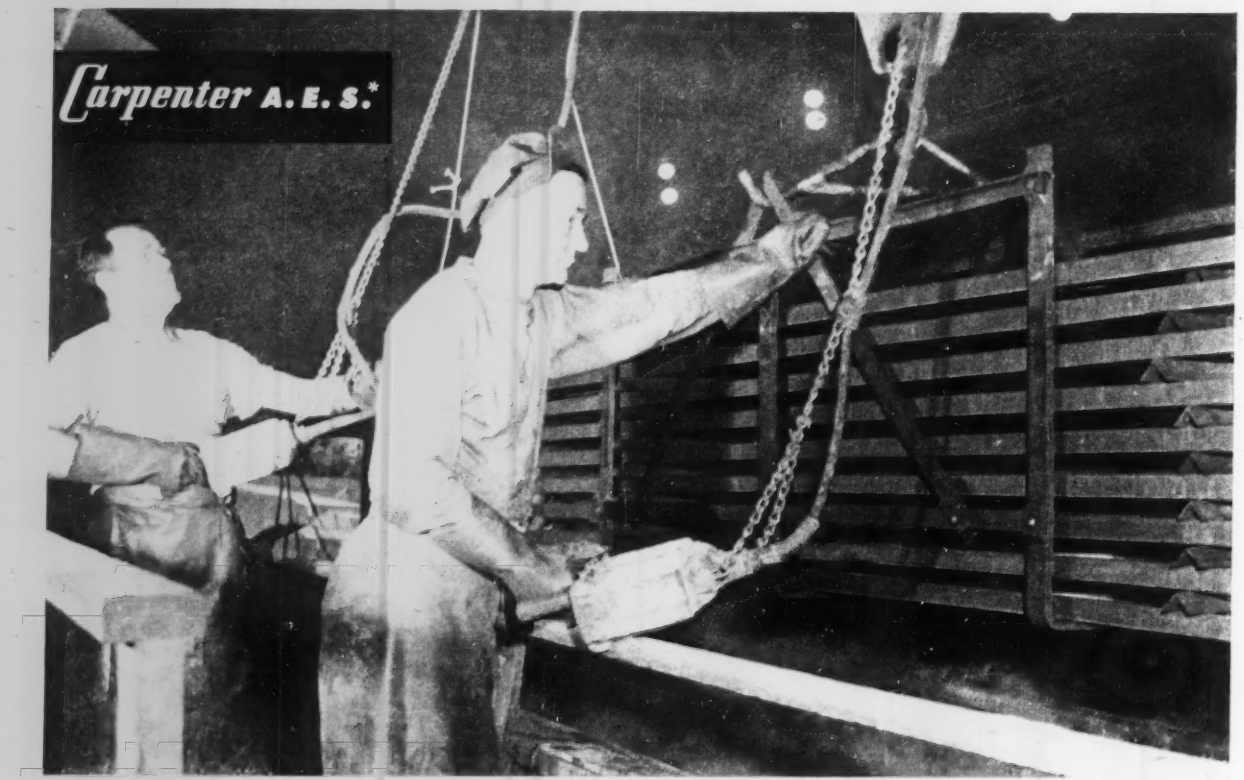
PRODUCTS
SINCE 1889
MAKERS OF BAKER'S MAGDOLITE

The J. E. Baker Company

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA

Plants: York, Billmeyer, Pennsylvania—Millersville, Ohio



Industry Solves a Hot Problem

*Another example of how Carpenter *Application Engineering Service is helping industry cut costs.*

Handling hot acids can be a dangerous and costly proposition for both men and equipment. A sudden splash or a spray of searing liquid . . . and workers are on the receiving end of serious burns. What's more, caustic acids, biting into equipment and process lines, cost even more in shut-downs and loss of production.

To help overcome problems like this, Carpenter metallurgists developed a new stainless designed specifically to resist the corrosive action of hot sulphuric acid. The photo above shows just one application for this super Stainless, Carpenter No. 20. It shows hangers supporting heavy loads of pole line hardware during pickling in 15% H_2SO_4 at temperatures up to 200 F. Obviously, this equipment *must* be dependable in resisting corrosion. And that was the problem. At one time these racks were made from ordinary steel and lasted only a short time before failing.

Then the company called on Carpenter, and Application Engineering Service went to work. Results: the new No. 20 racks adequately protected workers . . . gave dependable performance for many years!

Here's one more example of how Carpenter Application Engineering Service works alongside industry to improve products, reduce operating costs. It's a service backed by almost 70 years of leadership in specialty steel development. It has enabled Carpenter customers to be *first* to profit from a pioneering program involving new and better steels that make possible the "impossible". If *your* shopmen aren't familiar with A. E. S., perhaps you are the one to introduce them to it. A. E. S. goes to work in your shop as soon as you contact your Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

Carpenter

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

(*Continued from Page* 88)
with its $100-million expansion program. Ore bridges will have an over-all length of 545 ft. The dock will extend 777 ft along the river.

Flint Equipment To Build

Flint Equipment Corp., Rochester, N. Y., plans to purchase property in Gates, N. Y. The Gates zoning board of appeals has granted the Flint company a variance from the height rules of the zoning ordinance to permit erection of a plant.

Wesson Opens Detroit Branch

Wesson Metal Corp., Lexington, Ky., producer of cemented carbides, opened a branch office at 18353 W. McNichols, Detroit. Ray Gorman, general sales manager, is in charge of the new office. His office formerly was located in the affiliate Wesson Co., Ferndale, Mich. District offices will be established in other major industrial areas throughout the country.

Plans Helicopter Firm

Negotiations between Fleet Mfg. Ltd., Ft. Erie, Ont., and Doman Helicopters Inc., Danbury, Conn., have been held on formation of a new jointly owned company to make commercial helicopters in the Fleet plant. The proposal calls for "combining Doman designs with Fleet manufacturing facilities." The new company would be called Doman-Fleet Helicopters Ltd.

Astatic Corp. Buys Factory

Astatic Corp., Conneaut, O., purchased a factory building at Broad and Jackson streets, that city. The structure has 38,000 sq ft of factory space which the Astatic firm will use for expansion and storage.

Shear-Speed Names Agents

Shear-Speed Chemical Products Division, Michigan Tool Co., Detroit, appointed as representatives for its universal coolant-lubricant for industry: J. R. Armstrong, Indianapolis; Colonial Tool Co., Windsor, Ont.; Vincent L. Kennedy, Jackson, Mich.; Moen Sales & Engineering Co., Flint, Mich.; A. F. Olson, Buffalo.

Bristol Aeroplane Co. Formed

Bristol Aeroplane Co. of Canada Ltd. officially opened its engine plant in Montreal, Que. The new company has invested millions of dollars in the plant, equipment and special facilities required for the overhauling and testing of engines and accessories.

Clayton Forms Sales Units

Clayton Mfg. Co., El Monte, Calif., appointed J. J. Billman, formerly sales manager of its Steam Generator Division, as western sales manager with headquarters at the factory; H. M. Kirkby, eastern sales manager with headquarters at the company's Chicago office.

Bethlehem To Lease Plant

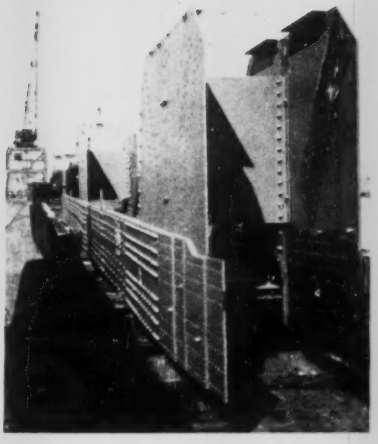
Alfred C. Gertis, Buffalo, has joined with New York interests in purchasing the former Bison Castings plant at 575 Howard St., that city. Bison Castings went out of business last spring. Mr. Gertis is leasing the plant to Bethlehem Steel Co., which plans to use it for storage of a by-product coming out of its Lackawanna plant.

Thor Buys Phillips Control

Thor Corp., Chicago, manufacturer of laundry and kitchen appliances, purchased Phillips Control Corp., Joilet, Ill., maker of components for the electronics industry. Phillips Control will be operated as a wholly owned subsidiary of Thor. John E. Mossman will remain as president of Phillips Control.

Builds Metal Carbides Plant

Metal Carbides Corp. is constructing a 40,000-sq-ft plant at 6001 Southern Blvd., Youngstown. The plant is scheduled to begin production in January of tungsten carbide metal, including tool tips, die nibs, bar stock, rings, bushings and special shapes. In addition to tungsten carbide metal, the plant will produce tantalum carbide, titanium carbide, tungsten alloy heavy metal, cermets and high temperature alloys. These products will be produced by powder metallurgy methods. The company will continue to operate its main plant at 107 E. Indianola Ave., that city.



Boeing Gets Beam

Three railroad freight cars were used to transport this 65-ton beam to the Seattle waterfront. It will be used by American Bridge Co., Pittsburgh, in constructing a jet bomber hangar for Boeing Airplane Co., Seattle

Grobet File Opens Branch

Grobet File Co. of America, New York, opened a branch in Hazel Park, Mich., under the management of Donald MacKay.

Pittsburgh Gear Co. Moves

Pittsburgh Gear Co. moved to its new quarters in Neville Island, Pa.

Livingstone Names Agent

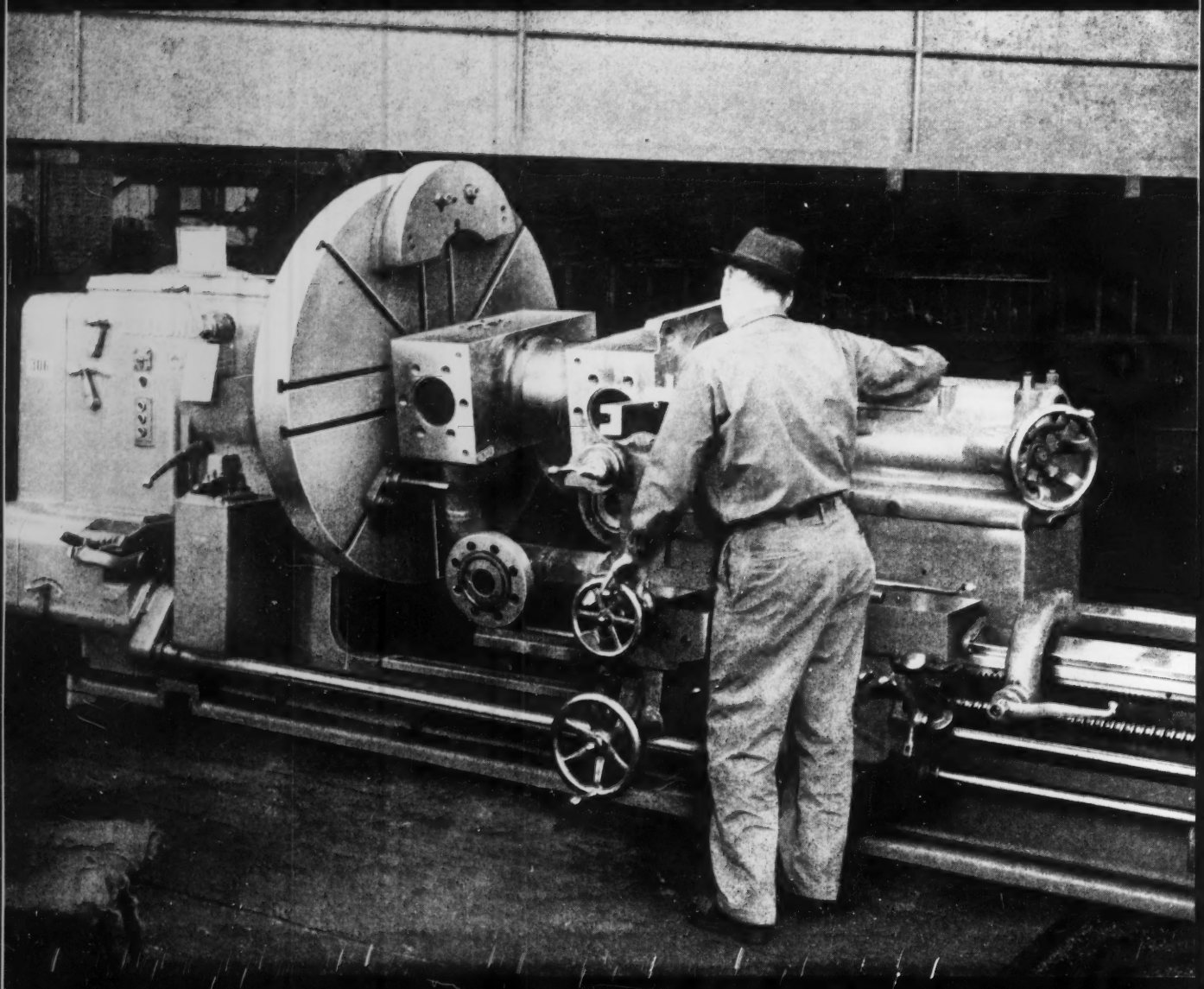
Livingstone Engineering Co., Worcester, Mass., manufacturer of boilers and cleaners, appointed Midwest General Corp., Detroit, as its representative in the territory.

Lincoln-Mercury Expands

An expansion program costing several million dollars at the assembly plant at Metuchen, N. J., is announced by Lincoln-Mercury Division, Ford Motor Co., Dearborn, Mich. Two additions to the Metuchen plant will add 120,000 sq ft of floor space. Paint facilities will be enlarged and rearranged,

(*Please turn to Page* 94)

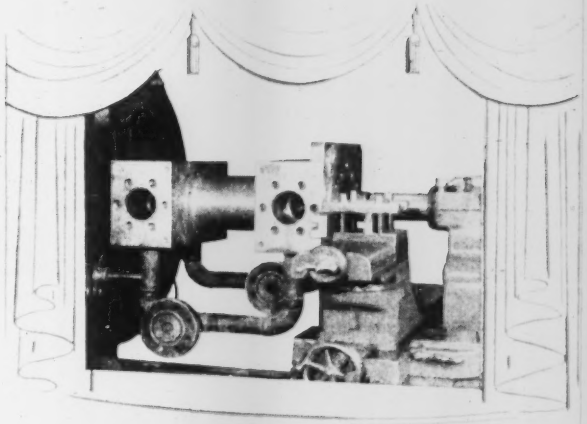
Le Blond Gap Lathe stars in 16-hour Variety



In operation shown, LeBlond 32"/60" Sliding Bed Gap Lathe is used to finish faces of compressor cylinder. Faces must be made parallel, square to bore. Extending manifolds require 78" swing. Job is supported on plug centers, weighs about 3 tons. Spindle speed, 76 rpm; feed, .010; 2 cuts; job time, approximately 110 minutes.

Show at Clark Brothers

Juggles Diameters From 6" to 78"
. . . Satisfies Critics
with Stellar Performance!



Clark Brothers Company, Olean, New York, had to "book" a one-lathe act—a single machine to turn out a wide variety of components for "Big-Inch" Type compressors. A special lathe for occasional large-diameter work was too costly.

"Talent scouts" at LeBlond's Buffalo distributor, The Buffalo Machinery Co., recommended their hottest variety number—a LeBlond 32"/60" Sliding Bed Gap Lathe.

Now this versatile machine performs 16-hours-a-day at Clark Brothers, takes the place of at least two machines. One specialty is truing-up and finishing heat-distorted compressor cylinders with manifolds already welded in place—faces must be made parallel. The sliding bed of the LeBlond Gap lathe opens up readily to meet the *78" swing requirement.*

With gap closed, it operates as a standard heavy duty engine lathe, turns power cylinders and cylinder liners *ranging from 6" to 30" diameters, requiring tolerances of ± .0015".*

The multi-purpose LeBlond Sliding Bed Gap Lathe is a sweetheart in the shop. Has adjustable gap and center distance. Four-way rapid traverse. Thirty-six spindle speeds are available, 5 to 500 rpm. Sixty feeds and threads. And, of course, you get all the well-known LeBlond features—hardened and ground steel bed ways, totally enclosed quick-change box, automatic lubrication, one-piece apron, thrust-lock tailstock and many more.

Whether your turning jobs call for versatility or production, heavy hogging or fine finishing, there's a LeBlond Lathe to turn them better, faster. Your LeBlond Distributor will tell you about the three Sliding Bed Gap Lathes, 16"/38", 25"/50", and 32"/60". Call him or write The R. K. LeBlond Machine Tool Company, Cincinnati 8, Ohio.

Ask for Bulletin SBG-103G for more information on LeBlond Sliding Bed Gap Lathes.

Cut with Confidence

LeBLOND *of Cincinnati*

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 66 YEARS*

(Continued from Page 91)
and ovens will be converted to gas. Metal finishing lines will be relocated and trim lines will be expanded. Also included in the expansion will be extensions and relocations of railroad tracks, roadways, storage areas, fire loops and parking lots.

Boosts Output of Gages

An expansion in production of SR-4 strain gage devices was announced by Baldwin-Lima-Hamilton Corp., Philadelphia. Growing demand for these devices necessitated construction of a plant by the company's associate, Ruge de-Forest Inc., Cambridge, Mass. The move does not affect the manufacture of SR-4 bonded resistance wire strain gages which continues at the Eddystone, Pa., plant of Baldwin-Lima-Hamilton Corp.

Freight Car Leasing Gains

A plan enabling short line railroads to lease freight cars through small monthly rentals is becoming accepted gradually as one of the answers to the car shortage problem. Originated by R. L. Morrison, president, Morrison Railway Supply Corp., Buffalo, the plan is tailored especially for short line roads which have limited capital.

Forgings Distributor Named

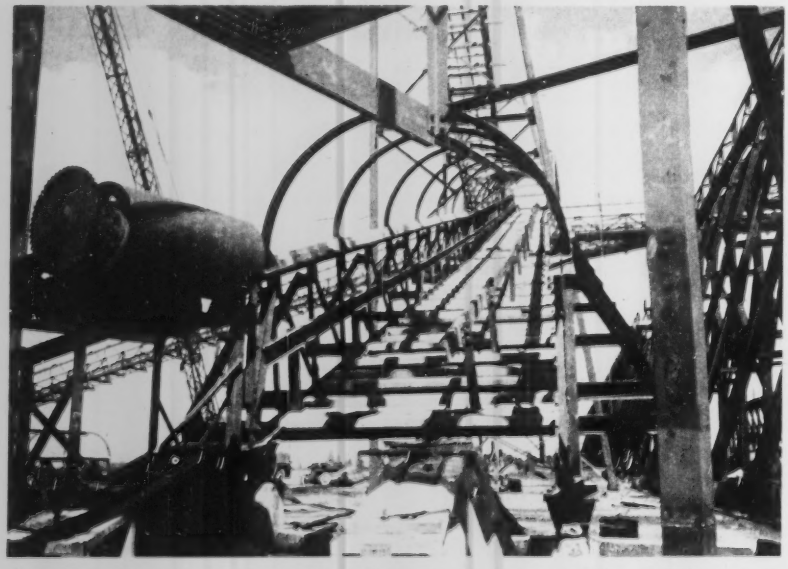
American Locomotive Co., New York, appointed American Forge & Steel Inc., Pittsburgh, as sole national distributor of its heavy commercial forgings, produced at its Schenectady, N. Y., plant. Distribution will be under the direction of S. B. Heppenstall Jr., president, and S. J. Mergenhagen, vice president of American Forge.

Kurt Orban Names Agent

Kurt Orban Co. Inc., New York, appointed International Machinery Co., New Haven, Conn., as sole distributor of its German machine tools in southern New England.

Young Testing Opens Plant

A plant containing 5000 sq ft for the manufacture of small precision elements that go into testing machines was opened by Young Testing Machine Co., Bridgeport, Pa. Products to be made include precision weighing systems, grips and all necessary testing accessories. It supplements the company's existent facilities for design and production of testing machines up to 3 million lb.



Lumber Firm's Conveyor Requires Large Steel Tonnage

Over 350 tons of steel are being used in the mile-long bridge for the Link Belt conveyor system under construction at Weyerhaeuser Timber Co.'s mill at Everett, Wash. Bethlehem Pacific Coast Steel Corp., San Francisco, supplied the structurals

Will Enter New Field

Michigan Tool Co. plans to buy Manistee Iron Works manufacturing rights

NEGOTIATIONS are under way for the purchase of the physical assets of Manistee Iron Works Co., Manistee, Mich., by Michigan Tool Co., Detroit. Manistee Iron is best known for such products as salt evaporators, pumps, valves and hydrants.

Under the proposal, Michigan Tool would acquire the name, goodwill and business of Manistee Iron and would assume the right to manufacture and sell all present products of the company. At the present time, Michigan Tool Co. is operating the Manistee plant as the lessee. Previously, National Electric Welding Machines Co., Bay City, Mich., acted as lessee.

Michigan Tool is one of the country's major machine tool builders specializing in all types of gear production equipment. It also produces cone-drive worm gears and worm gear speed reducers.

Stove Firm Leases Space

Dearborn Stove Co., Chicago, leased 34,500 sq ft of warehousing space from Erie Burial Case Co., Erie, Pa. Production in its Erie plant has increased 52 per cent since Dearborn acquired Odin Stove Co. last summer.

Lindberg Moves Plant

Lindberg Steel Treating Co. moved to its new plant at 1975 N. Ruby St., Melrose Park, Ill.

New Jersey Zinc Buys Mine

New Jersey Zinc Co., New York, purchased a mineral mining property in Mineral, Va., 48 miles northwest of the city of Richmond. The property, known as the Arminius mine, has been inactive for nearly 30 years. Results of diamond drilling, which has been under way for some time, led to the decision to purchase the property, unwater the mine and continue exploration for zinc and lead at depth. The work will be conducted under the supervision of W. L. Albers, superintendent of the company's Austinville, Va., operation.

CONTINENTAL

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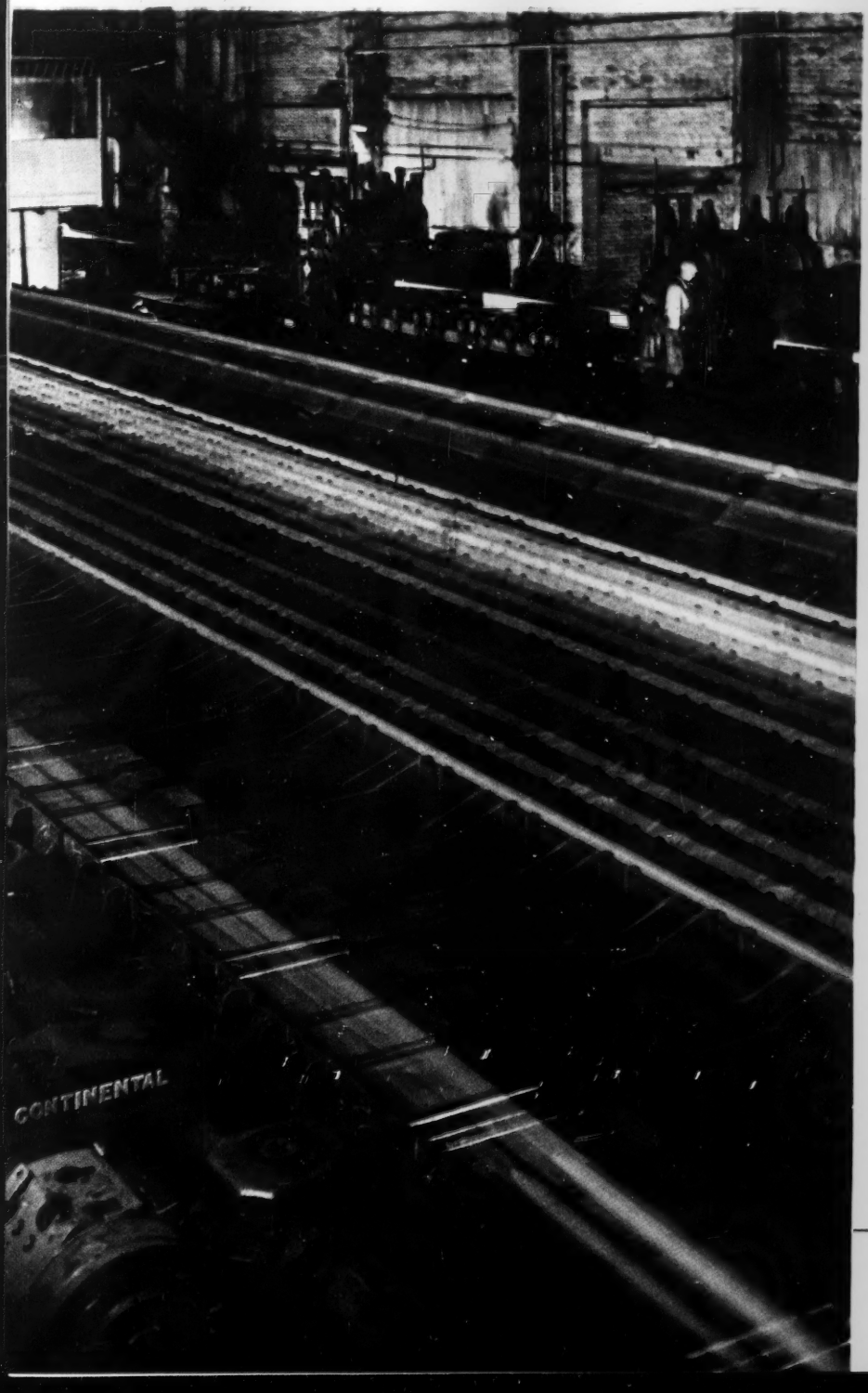

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ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

Deoxidation Studies Show Advantages of Silicomanganese

Silicomanganese has proved to be highly efficient and economical as a furnace block and deoxidizer, as well as an alloy addition. Steel producers have found that it saves furnace time, produces cleaner steel, and increases the yield of rolled products.

Excellent Blocking Addition

When used as a blocking addition, silicomanganese stops the carbon-oxygen reaction in the open hearth bath and permits close control of analysis. The alloy has a ratio of approximately 3.5 manganese to 1 silicon. This proportion will produce a high degree of deoxidation in the bath.

Why Silicomanganese Is Effective

The carbon boil is arrested more positively by this combination alloy, containing both silicon and manganese, than it is by larger amounts of silicon alone. As a result, close control of the carbon level can be maintained. Also, because of the low carbon content of silicomanganese, the heat may be blocked at a comparatively high carbon level. This saves furnace time, which is critical in reducing costs. Since silicomanganese gets more oxygen out of the bath than silicon alone, the steel is cleaner and has improved surface quality.

Metallurgical Studies Made

Work done by Herty and his associates (1,2) showed that manganese tends to flux silica inclusions resulting from deoxidation, and permits them to grow in size so that they float out of the bath more rapidly.

More recently, it was found by Hilty and Crafts (3) that manganese and silicon in combination lower the oxygen content much more than silicon alone (see Fig. 1). They also determined that, although manganese by itself is not a strong deoxidizer, it substantially intensifies the deoxidizing power of silicon.

It was shown that in steels with lower silicon contents (below 0.05 per cent), manganese in the amounts usually present as a residual has a strong influence. However, in the silicon range normally used for deoxidation (0.05 to 0.25 per cent), more manganese is required to obtain the full benefit of the combined deoxidizers. For example, at 1600 deg. C, iron with 0.10 per cent silicon and 0.10 per cent or less manganese contains about 0.017 per cent oxygen. With 0.50 per cent manganese, it contains only 0.009 per cent oxygen (see Fig. 1).

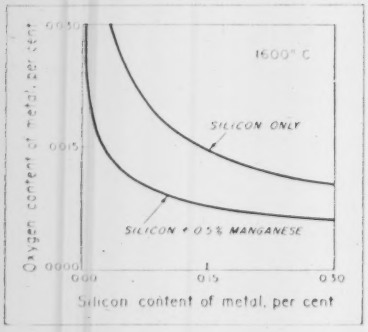

Fig. 1. Limit of solubility of oxygen in iron-silicon alloys, plain and with 0.50 per cent manganese at 1600 deg. Centigrade.

These data thus confirm an observation made by Tenenbaum and Brown (4) that steel as tapped from the furnace is materially lower in oxygen after blocking with silicomanganese.

In another study, made by Silliman and Forsyth (5), it was demonstrated that heavier than usual additions of silicomanganese result in a marked improvement in surface quality. About twice the usual addition of silicomanganese gave a substantial increase in the yield of finished product.

Silicomanganese Produces Cleaner Steel

Initial deoxidation in the furnace with silicomanganese produces very clean steel, particularly in grades below 0.25 per cent carbon. Several factors contribute to the cleansing action of silicomanganese. The amount of dirt in steel seems to be proportional to the maximum oxygen content prior to final deoxidation. Heats that are oxidized to a low carbon and recarburized, as were early rail and forging steels, are dirtier than those in which the carbon is "caught on the way down."

It is also well recognized that medium-manganese and low-carbon steels that are blocked at higher carbon (lower oxygen) contents, with low-carbon ferroalloys, are cleaner than those taken to a lower carbon level and recarburized with high-carbon ferroalloys. Silicomanganese is low enough in carbon to block at higher carbon levels. As pointed out by Tenenbaum (6), there is also a decided economic advantage in not driving to such low carbon contents before blocking.

Suitable For Ladle Additions

In addition to its use as a bath deoxidizer, silicomanganese has proved particularly effective as a ladle addition for the deoxidation of semi-killed steels. The alloy is also used to provide the complete ladle addition of manganese in the manufacture of medium-manganese, acid steel castings.

Metallurgical Service Available

Our metallurgists will be glad to help you with the use of ELECTROMET silicomanganese. This alloy contains 65 to 68 per cent manganese, and is produced in maximum 1.50, 2.00, and 3.00 per cent carbon grades. All grades are furnished in a lump size of 75 lb. x 2 in. and in a crushed size of 2 in. x down. If you wish further information, please write, wire, or phone the nearest ELECTROMET office: in Birmingham, Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.

References

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STEEL
November 30, 1953

Technical Outlook

BEARING MATERIALS— Bronze plate (83 per cent copper, 7 per cent tin) on bearing surfaces of hydraulic pumps is said to give better performance than solid bronze. Plating process was developed by Battelle Memorial Institute, Columbus, O.

TWO-FOR-ONE— Grinding speeds have almost been doubled in the production of cemented carbide jack bits for coal mining tools at the Carboloy Department of General Electric Co., Detroit. Gimmick: Jig for automatic, double-spindle grinder was designed to handle two jack bits instead of one.

RADIO CONTROL— Increased production schedules are being met at Timken Roller Bearing Co., Canton, O., with help of radio in materials handling. Case in point: When expanded melting capacity upped steel output of the melt shop about 20 per cent, materials handling was able to absorb the added load. Other steel plant operations were not required to enlarge their facilities.

TESTING BY EAR— A tone deaf inspector doesn't stand a chance at the Electro Refractories & Abrasive Corp.'s grinding wheel plant in Buffalo, N. Y. Wheels are tested sonically there. Distinctive musical notes given off indicate such things as size, hardness and invisible cracks.

GRINDER TAKES THE LONG WAY— Giant grinder has been installed at Monarch Machine Tool Co., Sidney, O., for precision grinding lathe bed ways up to 32 feet long. Grinding tolerances are held to 0.0005 inch over the entire length of the way. Length of the machine, built by Thompson Grinder Co., Springfield, O., is 79 feet. It is 13 feet high and 13½ feet wide. Machine has four 30-hp motors and one 10-hp motor driving the two grinding wheels. All operations are controlled from a pushbutton panel.

WINTER DRIVING—Heavy duty truck tires with about 80 steel claws per inch of tread width have been developed by B. F. Goodrich Co. Claws (made of steel wire) are permanently bound into four outer tread ribs during tire-molding process. Company says wire grippers last almost the life of original tread. Tires can be recapped with new or conventional tread.

PACKAGING THOUGHT— In ordnance packing, two rules are followed in use of volatile-type preservatives: To preserve packaged item for longest time, inhibitor must remain continuously active. This is done by providing best possible vapor barrier.

IDEAS FOR RARE EARTHS—By adding them, you can make physical properties of nodular iron more dependable, get better performance from welding rod coatings or bolster low-temperature shock resistance of alloy grades.

ISOTOPES—Gamma gage for measurement on a hot strip mill is being developed by Isotopes Products Ltd., Canada. Radioactive materials will work in proximity of 1100° F temperatures.

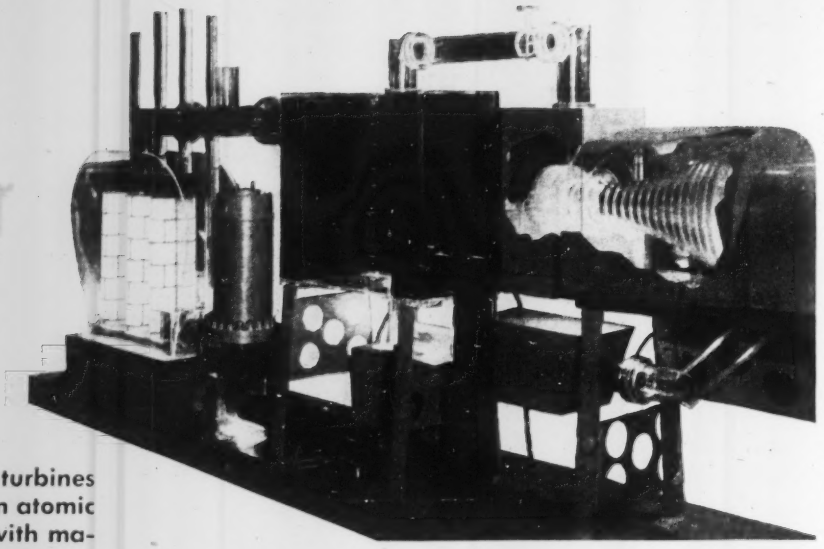
ADVANCES IN JOINING— Half-inch square of aluminum bonded to aluminum with rubber cement will support over a ton . . . that's the sort of job recently-developed structural adhesives are doing, according to B. F. Goodrich. Films of organic solder have strength of 10,000 psi with elongation characteristics up to 900 per cent, company says.

Metalworking Outlook p. 47 Market Outlook p. 149

Atomic Power

LATCH STRING IS OUT . . .

By DR. ALLEN G. GRAY
Technical Editor



There will be the same hum of turbines and generators using heat from atomic fission. Industry can help too with materials and components for firebox

AEC has taken the bull by the horns and announced plans to build an atomic power plant of some 60,000 kw—enough electricity to supply a normal city of 100,000. Belief is that the best way to get some of the answers to feasibility and economic questions of atomic power plants is the old trial and error route—build one and see.

True, AEC will own the reactor part of the power plant, which in itself will cost in the millions. It's simply the machine for converting nuclear energy into heat energy that can be employed for useful purposes. But, private enterprise and private capital are invited to participate in the more conventional parts of the project.

Help Wanted—AEC states that it will welcome offers from industry to invest risk capital in building the steam and turbine portions as well as in the operation of the entire plant. It is convinced that getting industry into the atomic energy program on a privately financed basis is essential to its ultimate goal—the development of economical nuclear power.

No one expects this first atomic plant to produce power at competitive costs. But it should provide engineers with the first real data on design, construction, and operation of a life-size operating model of an industrial power plant.

Only the Start—This first scale reactor will not be the sole effort of AEC in the nuclear power field. In the near future, it expects to propose the construction of several different types of reactors that will explore promising avenues of approach to practical nuclear power.

There will be many opportunities for industry to show off its wares. Materials that will not go to pieces in a reactor's heart must be found and proved. New instruments will be needed; new kinds of pumps, controls, heat exchangers and safety devices must be developed. In some quarters, this is being interpreted to mean that investment in plants producing equipment and materials for reactors and atomic power transmission is a good move.

Energy to Heat—Primary form of energy in a nuclear reactor is the kinetic energy of the fragments resulting from fission. Since no means have been developed for utilizing these high energy particles directly, their energy is reduced to ordinary heat energy by collisions with matter in the reactor core.

Atomic power reactors are thus fundamentally similar to conventional boilers with the exception that temperatures considerably higher than those obtained from regular fuels are theoretically possible. From the practical standpoint, high heat efficiency theoretically possible with the atom method cannot be capitalized on since all of the materials' limitations in conventional heat engines are present, plus a few more that are unique to atomic power machines.

Selection—Looking in the direction of fast kilowatts from the heat of atomic fission AEC took stock of its reactor assets. The shelf was not bare. One atomic project that had been advancing at a good clip was the submarine nuclear power plant. On the last day of May this year, a land based version of this Westinghouse-built submarine driver started turning over at AEC's Arco, Idaho, test station to generate a substantial amount of electricity.

Then, too, considerable work had been done with Westinghouse on a 60,000-kw reactor of similar principle to the submarine prototype for use in a large ship. At the close of fiscal 1953, military requirement for this large ship reactor was removed. However, the pressurized water reactor which was viewed as the best approach for this large ship reactor also was considered as a promising approach for central station power. So it was no great surprise when AEC announced that its first attempt at a large scale power reactor would be made with Westinghouse Electric Corp. as contractor, with Rear Admiral H. G. Rickover—who had been pushing hard on the naval reactors—to boss the job.

Extract Heat—Chances are, the reactor for this first try at nu-

clear kilowatts will bear close resemblance to the 60,000-kw job that was on the drawing board for ship propulsion. Heat will be generated in an atomic firebox from a chain reaction using a fuel which probably will consist of enriched uranium—that is uranium containing higher percentage of fissionable uranium-235 than is present in natural uranium.

Water under pressure or some other cooling agent will be pumped in to bring out the heat. This heat will serve the same purpose as in a conventional boiler converting water to steam that pushes the turbine. No great changes are expected in the turbine or generator part of the plant at this stage.

New Problems—The metallurgist has an important role to play in the atomic power race. Not only must he make and shape the fissionable metals themselves but he must also develop and fabricate materials to withstand the extreme conditions imposed on nuclear reactor components by the high heat transfer rates needed for efficient utilization of atomic fuel.

Materials of construction for nuclear reactors are primarily selected on the basis of a property that was virtually unknown a few years ago—that of neutron capture cross section. Conventional properties such as strength, corrosion resistance, formability and heat conductivity are examined only if it is felt that the nuclear requirements can be met. Another factor: All metals suffer, to a greater or lesser degree, changes in dimensions, thermal conductivity, strength and other important properties when used in a reactor.

Groups—There are five convenient functional categories into which metals used for atomic power reactors can be divided: Structural materials; moderator materials; control materials; fuel materials; and source materials. These material groups were designated by Dr. William A. Johnson, manager, Westinghouse Atomic Power Reactor and Materials Department, before the National Industrial Conference Board's atomic energy meeting in New York the end of last month.

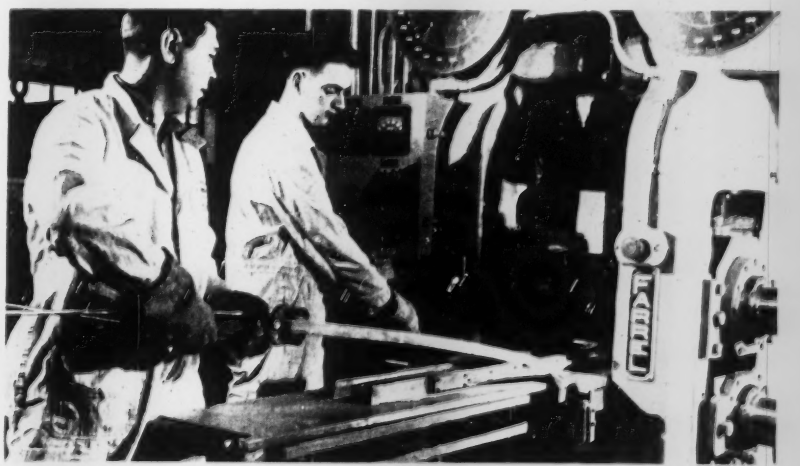
Structural materials for a reactor serve no nuclear function in the strict sense of the word. However, for neutron economy, which in the future may well be dollar economy, they must have a low neutron capture cross section. This is indeed a restriction: None of the major constituents of common corrosion resistant and high temperature alloys iron, nickel, chromium, cobalt, tungsten, molybdenum, titanium have thermal cross sections sufficiently low for attractive neutron-economy. Intermediate and fast reactors provide somewhat more leeway than thermal reactors in this direction and materials like stainless steels may often be used.

Limited—Of the low neutron absorption metals, only beryllium, zirconium, magnesium and aluminum have potentially useful structural properties. Magnesium and aluminum are not looked at too favorably by the nuclear engineer because of their relatively low melting point, poor mechanical properties at only slightly elevated temperatures, and questionable corrosion resistance in desirable heat transfer media. Here you have the reasons why extensive development programs are being carried out on zirconium and beryllium.

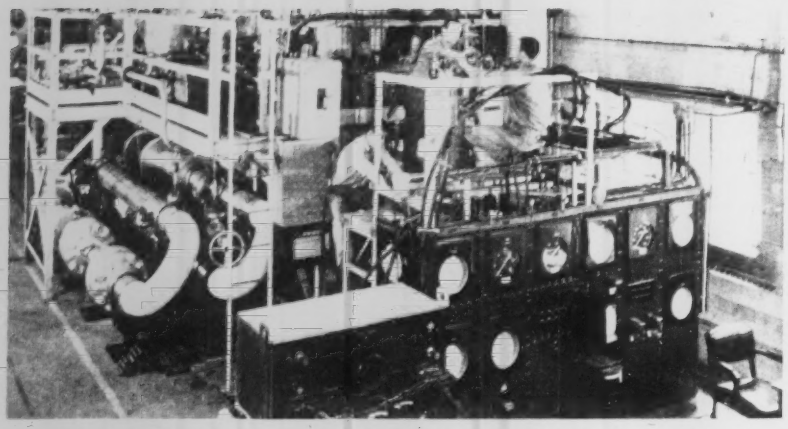
Moderator materials serve the nuclear function of slowing down neutrons from the very high energies at which they emerge in fission to thermal energies. They must have low atomic weight and low neutron absorption. Only metal satisfying these requirements is beryllium. It thus attracts a two fold interest for the nuclear metallurgist: As a structural material and moderator medium. Nonmetals such as hydrogen, deuterium and graphite are often used as moderator.

Adjust Power—Control materials serve the nuclear function of absorbing neutrons in a controlled manner to permit adjustment of reactivity. By inserting or withdrawing such materials the reactor can be shut down, started up, or its power level changed. Materials having very high neutron absorption are used for control purposes. Most metals absorb too

Zirconium ingot is hardness tested



Vital for atomic power, zirconium parts are hot rolled at Westinghouse



Many components are required to make atomic firebox go. Here reactor coolant pumps are tested to prove their performance before use

many neutrons for efficient use as *structural materials*, but only a few metals absorb enough neutrons for efficient use as *control* materials. Most useful metals for this purpose: Cadmium, boron, some of the rare earths, gold, and hafnium.

Here is how they stack up property-wise. Cadmium has a rather low melting point. Boron has a high melting point, good resistance to many corroding media, but is rather brittle. If used in atomic power reactors it is likely that these metals will find use as minor alloying components in base metals of more suitable engineering properties. Rare earth metals are scarce and expensive and their engineering properties are poor. Gold is obviously expensive. A newcomer to the metal field, so far as availability is concerned, is hafnium. It provides good combination of high neutron absorption with desirable properties.

Heat First—The nuclear purpose of providing fissionable atoms is served by fuel metals. Most familiar is uranium-235 which is found in natural uranium in concentration of 0.7 per cent. Others: Uranium-233 and plutonium. Source metals provide atoms which can be transmuted into fissionable material. Examples: Uranium-233 is formed by neutron bombardment of thorium; plutonium by neutron bombardment of uranium-238 the naturally occuring form of uranium metal.

At the present time it is not always possible, using a preferred metal, to develop treatments or alloys that satisfy the usual material requirements of strength and corrosion resistance, plus the unusual requirement of resistance to radiation damage. Limitations require that the reactor engineer design around the difficulty or compromise with the ideal nuclear requirement.

First on the List—Zirconium is the metal that has been most in the spotlight as a structural material for nuclear power plants. Total U. S. production in 1945 was only 20 pounds. One producer alone, Carborundum Metals Corp., is now getting set to supply AEC with 150,000 pounds per year of atomic grade zirconium. To produce atomic grade material a special treatment must be used to get rid of about 2 per cent hafnium which is a contaminant in practically all zirconium minerals and is not removed by usual metallurgical processing.

Availability-wise, the future of zirconium is good. It is the eleventh most common element in the earth's crust and is more plentiful than copper, lead, nickel, and zinc. Large workable deposits are available in this country.

Melting — Zirconium may be melted in a graphite crucible under inert atmosphere. Carbon pick-up is in the range 0.10 to 0.15 per cent. This may render the metal unsuited for certain corrosion applications. More recently an arc melting process has been used. Zirconium is melted by an arc between a molten pool contained in a water-cooled crucible and an inert electrode or consumable electrode of pressed zirconium sponge —500-pound ingots, 12 inches in diameter, are produced regularly. Equipment is being planned for 1000-pound ingots.

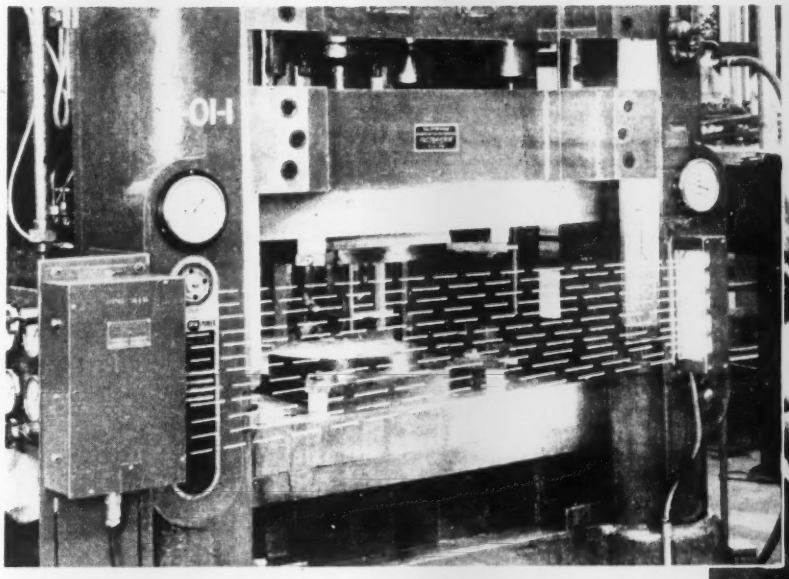
Standard zirconium shapes are made by practically all the conventional metalworking processes extrusion, rolling, wire drawing, deep drawing and spinning. In the early stage of the game, fabrication of small ingots was carried out in copper or iron sheaths to prevent excessive contamination by the atmosphere during hot working. Large ingots now turned out are hot forged and rolled with commercial steel mill equipment.

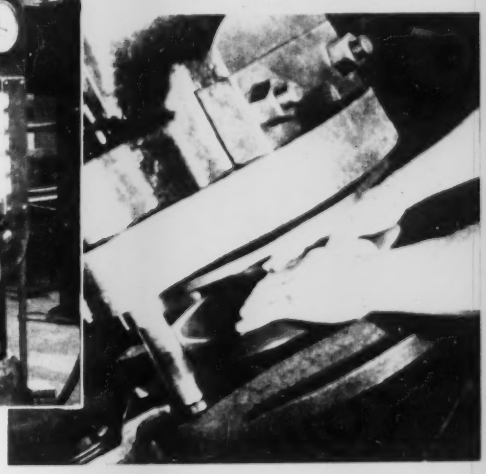
Zirconium metal is quite similar in its mechanical properties to the austenitic stainless steels; it can be alloyed to show similar strength properties. However, it does not have useful high temperature properties and loses its strength rapidly above 900 F.

Bonus Here—Marked corrosion resistance, ease of fabrication and joining, toughness, freedom from internal stresses these important properties of zirconium will eventually lead to its wide use outside of atomic energy. Only acids that attack zirconium are hydrofluoric, concentrated sulfuric and phosphoric. In resistance to hydrochloric it is exceeded only by tantalum and the precious metals. Resistance to alkalies is better than tantalum, titanium or stainless steels.

Until a better metal comes along, these same properties, plus low neutron capture cross section, makes it the number one nuclear reactor structural material.

Beryllium, the other metal noted for its transparency to neutrons now compares favorably with zirconium on price per unit volume basis. On the other hand, it is in a rather unfavorable position with respect to potential supply. Real bottle neck: Problems of ductility and workability, which at the present time are regarded as almost insurmountable. Chances are beryllium will have a hard time making a place for itself as a structural material for atomic power reactors, but its unique nuclear properties may justify its use as a moderator metal in spite of the extreme mechanical difficulties involved.





Electronic control. Broken lines show area protected by curtain of light Dangerous practices can be avoided with press guarding devices (below)

What About Your Safety Program?

Hit and miss knowledge of safety devices in stamping plant can be costly. Aside from proper equipment, management must supply operators with all available information

By HARRY CHANDLER
Associate Editor

OPERATORS at a small eastern stamping plant were quick to dope out the easy way to run a new line of presses. (They would make only one cycle even when treadles were held permanently in the down position.)

In spite of the fact that all hands had been exposed to a standard dose of safety talk and literature, management probably anticipated this misapplication of nonrepeat devices on the new presses, but it is less likely that it foresaw the next turn of events.

Treadle holding was habit forming, and operators continued to practice it after being switched to presses without the single stroke feature. Immediate result: Counters on old presses were way off because of nonproductive, repeat strokes. Inevitable result: A piece cocked after it was stamped, and on the repeat, the die shattered and injured the operator.

Moral—For those at the helm of safety programs, this incident seems to point up the problem. Reading between the lines, the message is: "Don't underestimate the intelligence of the operator, but never overestimate the amount of information on safety he has or his ability to forget it."

Obviously, a stamping plant is only half safe even after the most modern equipment and safety devices have been provided by management. Other half of the equation involves the human element; a constant campaign of education and re-education must be waged.

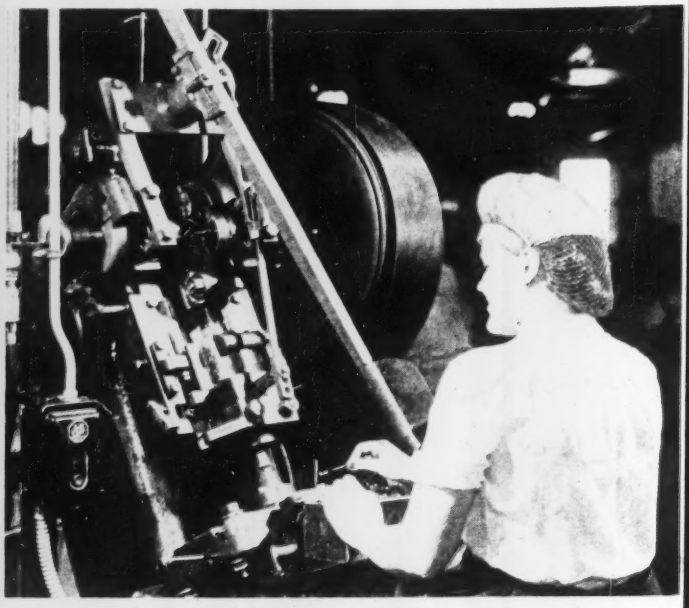
No doubt, management at the small eastern plant went one step better when it took another look at its safety program after the accident and asked the question: "Are we sure we have all available information to pass on to the men and women running our presses?"

Ammunition—Under certain conditions, a safety device may give years of accident-free service, while under others, its performance may be something short of foolproof. But where can you lay hands on such information?

Its readily available, for instance, through the American Standards Association, National Safety Council, insurance companies and manufacturers of press guarding equipment.

This article, based in part on

Two-hand, mechanical tripping device. With this type safety control, operator has free access to die area

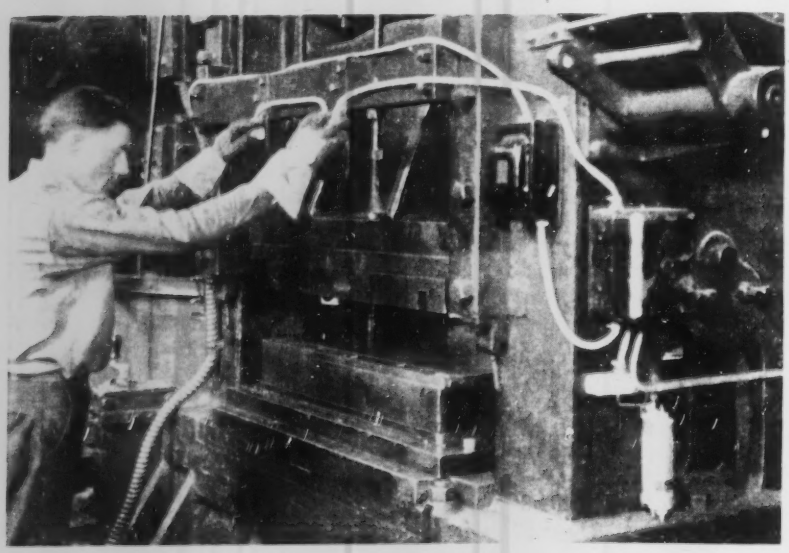


Sweep guard. Sweep that is activated by motion of the ram is designed to push operator's hands out of way

the American Standards Association's pamphlet B11 on power press safety and on transcripts of proceedings of the Pressed Metal Institute, is confined to press and die guards. By no means does it exhaust the subject, but it is illustrative of the type of information available from several sources.

Where to Start — Taking first things first, perhaps the best place to get the ball rolling is to evaluate items that are first cousins to safety devices.

Checklist should take in lighting, seating, location of presses, housekeeping, air systems, belts, clutches, clutch dogs, brakes, treadles and the condition of safety equipment.



Two push-button electric controls. Control location requires operator to remove his hands from danger zone

Barrier Guards—This type encloses the danger zone. Good construction is rod stock in vertical position. Horizontal slots or spaces cause eye strain and limit visibility of die zone.

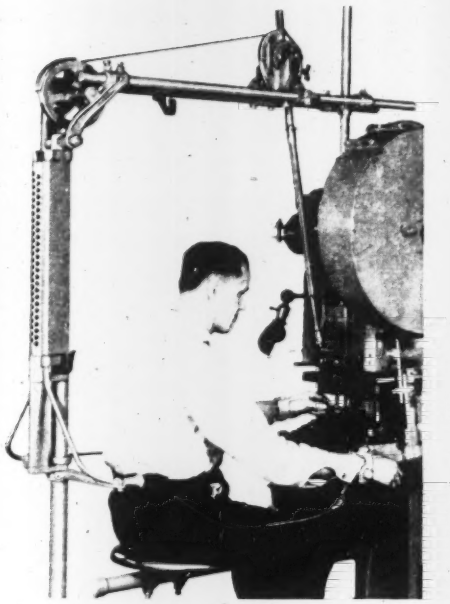
Even with feeding devices, provide guard so operator can't reach over or around feeding device into danger zone. Provide stick or pick to relieve jams or remove scrap.

Gate Guards—Here gate drops in front of die before press can be tripped. Obstructions, say hands, prevent tripping.

Advantages: Operator has access to die when gate is up; press cannot be tripped unless guard is protecting point of operation; in some cases, gate may be used as a barrier guard.

Limitations: No protection in case of mechanical failure or repeat action of press; unless properly designed and applied, guard may be up before ram completes down stroke.

Two-hand Tripping Device — With this type, tweezers or other



Pull-out guard. When properly attached and adjusted, device removes hands from danger as ram descends

hand tools are recommended for nesting operations, along with single-stroke attachments. To prevent tying down of one of the controls, three steps may be taken:

Electrically - operated, tripping devices: Circuit relays should permit only one stroke of press for each operation of hand control. Pneumatic controls: Use measured chamber that allows only one stroke of press for each operation of hand valve. Mechanically-motivated controls: Mechanism should be such that both hand levers shall be released and depressed for each stroke of press.

Advantages: When properly designed and located, both hands must be removed from danger zone to trip press; free access to die; minimum adjustments during normal operation.

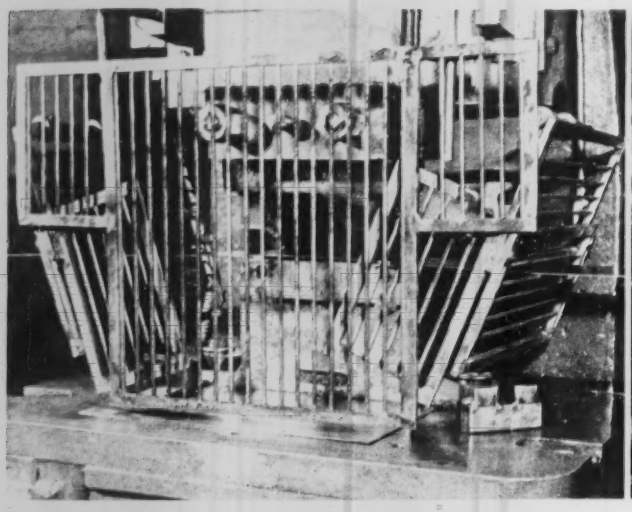
Limitations: No protection in case of mechanical failure or repeat stroke; operator may tie down lever, wedge control button or use elbow to trip press if device is not properly designed and located; on positive clutch presses, hands are free instant ram starts down - locate controls to prevent entry of hands into danger zone before ram completes down stroke.

Pull-out Guards—When proper-

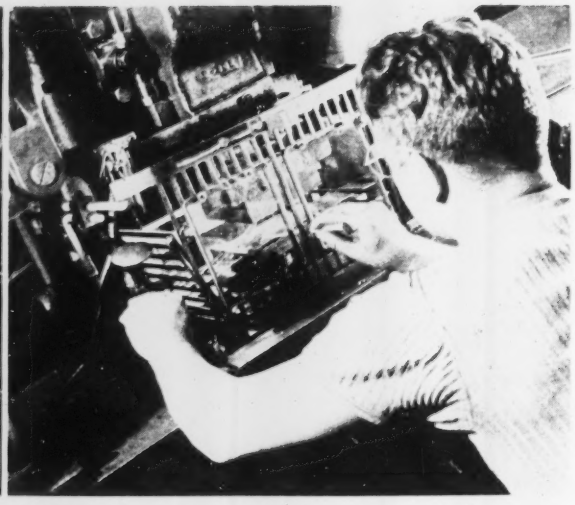
Punch Press Inspection Chart

Inspection Items	Inspection Hints
LIGHTING	Check sufficient lighting at point of operation to prevent fatigue, eye strain and improve quality and production.
SEATING	Seating should be of proper height and chairs or stools should be in good repair.
LOCATION	Location of press should allow for easy removal of finished parts, room for strip stock for blanking operations, safe accesses to press, keeping operator away from interference of passers-by.
HOUSE-KEEPING	Consider feed tables for machines, methods of keeping material off floor, no bolster plates, dies or other material leaning against press or on press. General orderly condition should exist.
AIR	If air is used for ejection or operation, check for leaks, proper valve operation and general conditions. Question whether air is being used.
BELTS	Check condition of belt looseness, signs of breakage and question of guarding or replacement of worn belts.
CLUTCH	Operate press several times to check clutch for repeat. If nonrepeat type, check. Note if clutch is "gummed up" with hardened grease or oil. Where clutch has springs, check springs. If clutch is worn, suggest repairs or replacement. Clutch pins to be purchased from press manufacturers.
CLUTCH DOG	Make sure clutch dog returns to neutral position after each stroke. Check return spring and safety spring. Condition of bolts or screws. Note if clutch dog is "gummed up" with hardened grease or oil. Check clutch dog for wear and replace if necessary. Suggest purchase of clutch dogs from press manufacturers.
BRAKE	Check for wear of brake band and poor condition due to saturation of brake band with oil or grease. Check bolt fastening brake shoe to press for condition and tightness. Check brake for proper adjustment.
TREADLE	If treadle operated, see that bolts, pins and cotter pins are properly fastened. Check possibilities of treadle sticking by rubbing against press or poor springs. Check height and distance away from press of treadle. Make suggestions for adjustment where necessary. Check treadle guard to allow sufficient foot room for operator and prevent tripping of the press by falling objects.
LUBRICATION	See if proper grade oil is used. Oil is to be preferred over grease. It will not harden and "gum up" clutch pin and clutch dog. This is particularly true when the press is in cold locations. Proper grade is important. Check how often machine is oiled.
GUARDS	No matter what type of guard is used, all parts should be checked carefully. If any part of guard is in need of repair or adjustment, notation should be made. If guard is provided and not in use, it should be entered under remarks. If guard is not practical for operations, it should be noted and proper type suggested.

American Standards Association



Barrier guard here is adjustable for various sizes of dies. Horizontal rods on side guard allow easy feeding



Barrier guard. Notice application of clear plastic panels to improve vision. Device encloses danger zone

ly attached and adjusted, this type of guard removes hands from danger zone.

Advantages: Additional motions are not introduced into operating cycle; view of the operator is not obstructed.

Limitations: Guard is generally limited to nesting or secondary operations and jobs where operator can remain in feeding position; operator may resent being tied to machine unless educated in its uses; he may not hook cables to wrists unless closely supervised; proper adjustment is important and requires careful training of setup man.

Guard must be re-adjusted and checked every time press setup or operator are changed; visual inspection of critical moving parts is sometimes difficult; on short-stroke presses, sufficient pull back may not be obtained without proper multiplier.

Sweep Guard—Designed to push operator's hands out of the way, guard is activated by motion of ram. Best use is on small presses and dies (not over 6 inches wide).

Advantages: Same protection in case of clutch failure as for a regular stroke of the press; it is easily adjusted.

Limitations: If guard swings in arc and its radius is small compared to length and front of die, a space is never guarded at end of stroke; when not properly designed or adjusted and sweep moves quickly, it may be possible to reach into a nip point after sweep passes; if it moves slowly, sweep may not clear danger zone in time.

If die is large and arm of operator is struck by the sweep, there is possibility elbow will bend and hand will remain in danger zone; it is easy to reach around guard into point of operation; if barriers are used to prevent reaching around sweep, barrier may prevent sweep from clearing the hand in case of need; if hand were in a deep indentation in the die, sweep would not remove it.

Electronic Safety Devices — Based on the electric eye principle, they have been successful on presses with friction clutches or brakes that stop the press at any point of the ram stroke. Press must be made inoperative in case of light or photoelectric relay failure.

Advantages: No moving or mechanical guard mechanism to interfer with operation or obstruct view; guard is applicable to large presses where other types of guards are impracticable.

Limitations: Ram must be capable of being stopped on down stroke; device must be far enough from danger zones to stop ram before operator's hand can get under it; sufficient number of light beams must be used to cover the open area with the curtain of light.

Die Guards — Individual die guards, a form of fixed barrier guards, can be used in press operations that do not require placing hands between punch and die. Guards should be attached to die shoe or stripper in a fixed position and designed to prevent operator's hands from reaching over, under or around guard into point of operation.

Because die is enclosed and guard is permanent part of it, type is superior to other methods. Building tips: Provide for easy feeding and good visibility. For latter, transparent materials are becoming popular.

If die guards are impractical, as in short runs, adjustable barrier guards may be used in blanking operations or where operator is not required to feed under punch. Warning: Proper adjustment is critical and operators should not be allowed to make changes.

For ready access to die, interlocked barrier guards are available. They are successful on automatic presses where jams require exposure of the point of operation to relieve them.

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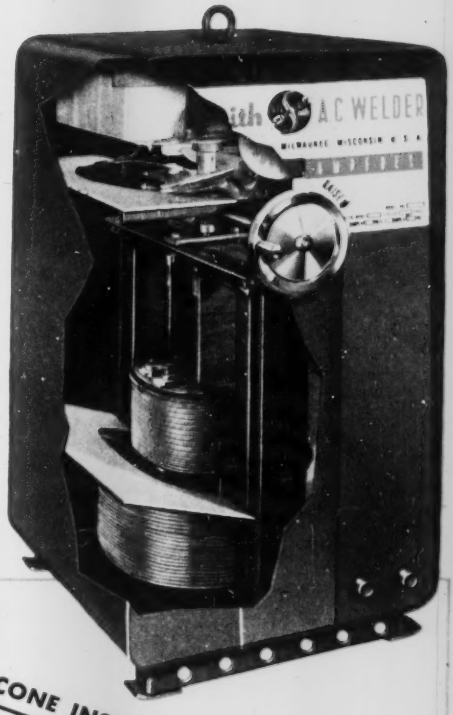

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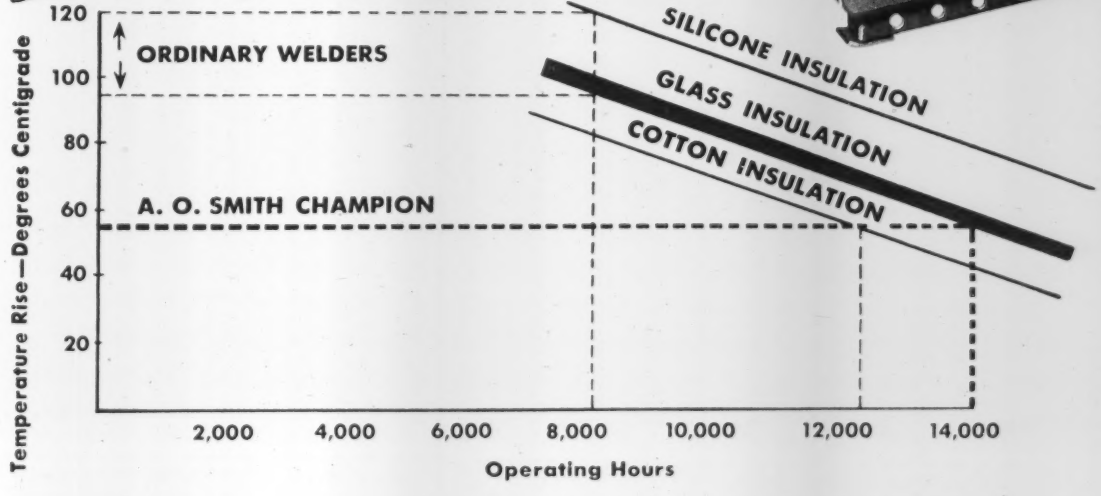
PROOF

LIFE EXPECTANCY CHART



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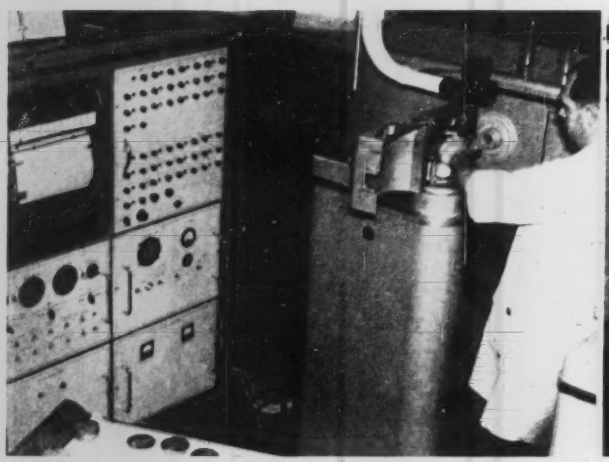
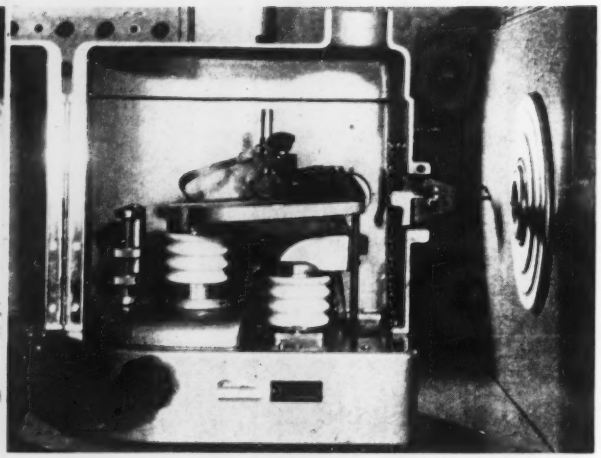


Zinc alloy sample disc is placed in the excitation stand for quantometric analysis at M. P. Kirk Co., Los Angeles



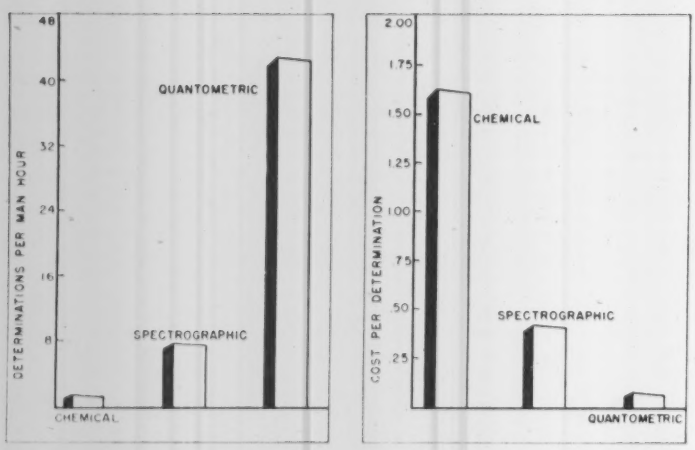
Sample specimen is in position for analysis at Frankford Army Ordnance. Lab has two test units of this type

Modern Spectrography . . .

SPEED PAYS HIGH COST OF KNOWING

Economics of composition control in metals puts greater emphasis on speed. Fast analysis means costly equipment but savings more than meet the payments

By NORMAN LYNN
Los Angeles Correspondent



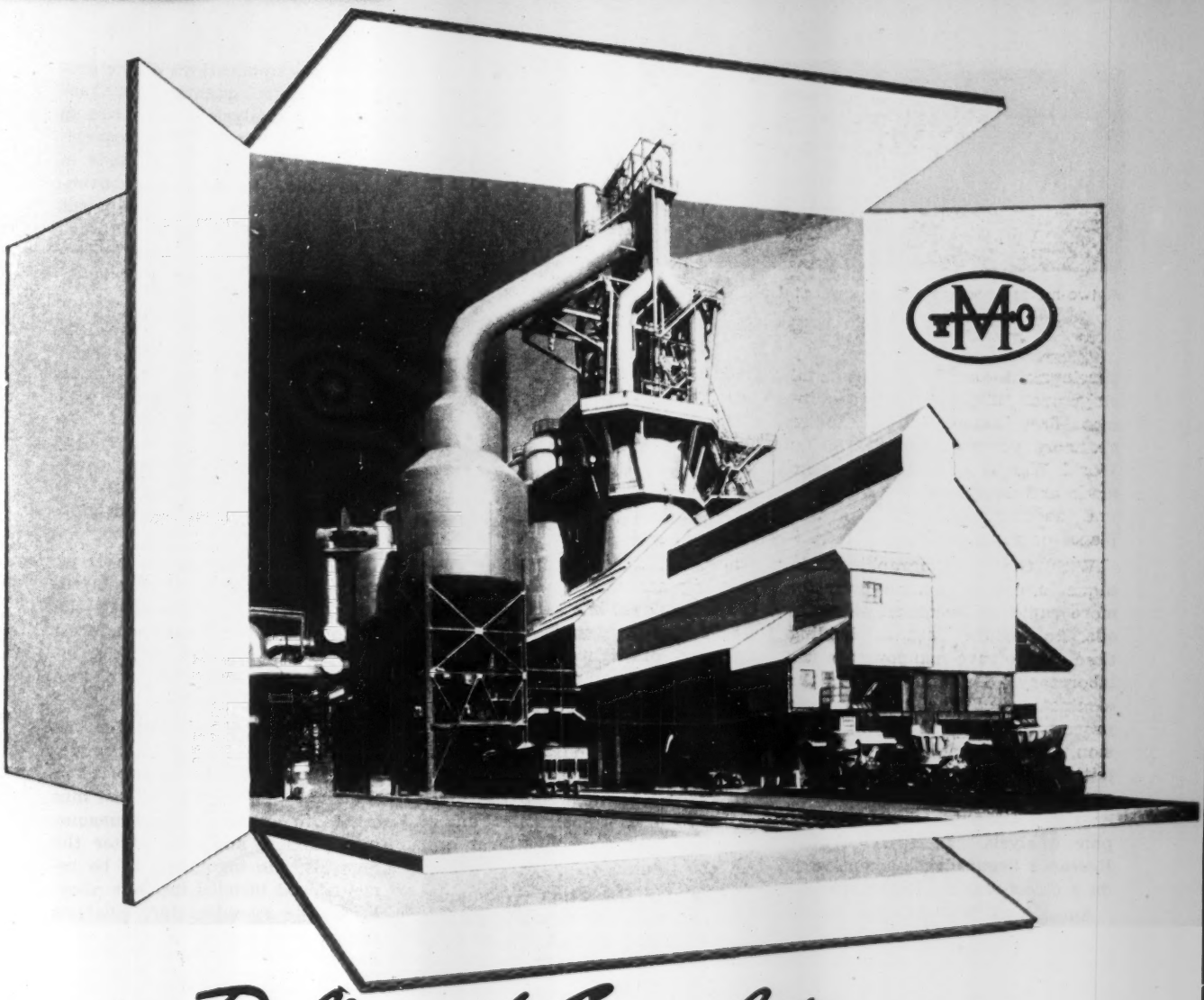
Graphs assume spectrographic or quantometric laboratory has sufficient samples to assure continuous operation. Salaries of an analytical chemist and a spectrographer are sufficiently similar to neglect them on a comparative basis. Costs of analytical reagents and laboratory glassware are in most cases equal to or only slightly higher than costs incurred in a spectrographic laboratory, i.e., film and film processing chemicals, graphite electrodes, etc.

AT ONE TIME or another, every producer of steel has given thought to the economics of composition control with special regard to both impurity elements and major constituents.

Where melting practices involve tons of metal, the plant metallurgist has been plagued, during the past decade, with shortages of certain alloying elements, and has had to substitute materials in many cases. Forced to use scrap, he has encountered the problems of "tramp" elements.

It is now more important than ever to control specifications during the melting and refining stages in the manufacture of all types of steel, and it is in these stages that the spectrographic technique has come into its own, culminating in the development of the rapid, direct-reading quantometer, product of Applied Research Laboratories, Glendale, Calif.

Started Early — Spectrographic technique itself is not new. It was introduced in the field of quality control of metals in 1925. In the



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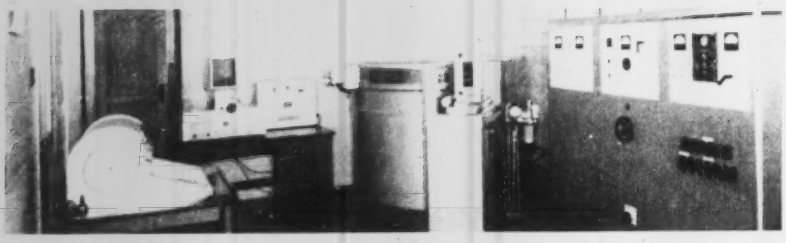

A two-meter spectrograph is used at USS, Geneva, Utah, for control analysis

development and experimental stage until 1934, commercial equipment first became available after six more years of work. During World War II great strides were made and acceptance became general as increased emphasis was placed on rapid control methods.

With the spectrographic technique in use, a demand grew for more rapid and economical methods, to reduce furnace holding time and to save manpower in the laboratory. Demand was for the elimination of the photographic process, thereby increasing precision, saving valuable time, and permitting the extension of the technique to high-alloy materials hitherto not amenable to spectrographic analysis. In 1942, Applied Research began development work on a direct-reading instrument.

Success in 1947 — The direct-reading research quantometer, introduced to the steel industry in 1947, proved that more and better analysis could be obtained with a substantial saving in manpower, time, and by the elimination of scrap. Its successor, the production control quantometer, first appeared in 1950 and comprises spectrometer, recording console, and high-precision source unit.

Adjusts for Versatility—Fundamental design of the production control quantometer allows versatility. Although standardized components are used, each instrument is individually adjusted and calibrated to satisfy particular analytical needs.

Instrument has been successfully applied to the analysis of high and low alloy steels, aluminum, copper, brass, zinc, lead and tin. In nonmetallics it has been applied to slags, ores, and oil additives. It may be used wherever spectrographic methods are applicable and a routine analytical program may be established.

Reading Accuracies — Eighty channels, or element ranges, may be set up to encompass the ranges of concentration found in a variety of analytical problems. Each range can be calibrated to cover the full chart width, insuring optimum reading accuracy. Electronic circuits employed in combination with the optical system permit the recording of light intensities accurate to 0.1 per cent.

The production control unit has eliminated the errors introduced by the photographic process and permits the expansion of the spectrographic technique to the high-alloy field where concentrations of some elements reach 40 per cent of the total.

One-man Operation — Samples are obtained by casting in an iron mold. A half-inch slice is cut from the bottom of the chilled piece and, after sanding on the inside surface, is ready for sparking. Operator places the sample on the spark stand, using a pointed graphite rod as the counter electrode. Start button is pushed and the instrument automatically determines the proper exposure time, makes a written record of the results, and is ready for a duplicate exposure or the next sample.

During the exposure period the operator has sufficient time to obtain the next sample, prepare a new electrode, and prepare to change the sample during the interval that the analysis is being recorded. This phase of the analysis requires two to four minutes, depending on the material to be analyzed.

Slag Analysis—One of the most recent additions to direct-reading spectrochemical analysis has been the inclusion of slag analysis among the applications of the production control quantometer. Complete slag analysis can be run in about 20 minutes. While considerable progress has been made in this type of analysis using conventional spectrographic equipment during the past few years, full use has not been made of the knowledge gained.

Close control of the character of slags has long been recognized by melting-plant metallurgists as the answer to the wastage of alloying elements. The prevention of material loss and loss of time in laboratory analysis is a major consideration, and wider use of advance spectrochemical analytical techniques is being noted throughout the industry.

Costs and Savings—In a large steel mill, Applied Research reports, the cost of installing the production control quantometer is between $35,000 and $50,000, including instrumentation, air conditioning and laboratory space.

Advent of the quantometer has permitted many changes in production. Formerly, the scrap used in foundries was melted and cast into ingots to await the time-consuming chemical analysis. After the analysis, the ingot had to be remelted and blended into the alloy. With the quantometer, analysis can be performed in a few minutes and the alloy can be blended during the original heat.

No "Off-Heats" — In reduction plants the molten metal from the furnaces can be alloyed and the metal processed with rapidity and minimum heat loss. Furnace time and the cost of remelting "off-heats" pays for a quantometer laboratory in a few months.

Savings of $100 per melt per furnace are claimed for the instrument, which may handle up to ten furnaces. These savings are computed on the basis of the availability of preliminary slag analyses during the refining process, the high-speed determination of constituents and sample analyses before tapping. Approximately 20 minutes can be saved in every melt of from 5 to 8 hours. To arrive at the figure of $100 per melt, operating costs, overhead and depreciation are estimated at $5 to $6 per minute.

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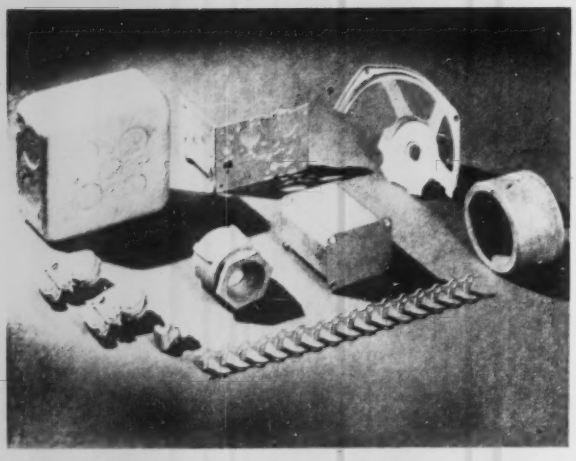
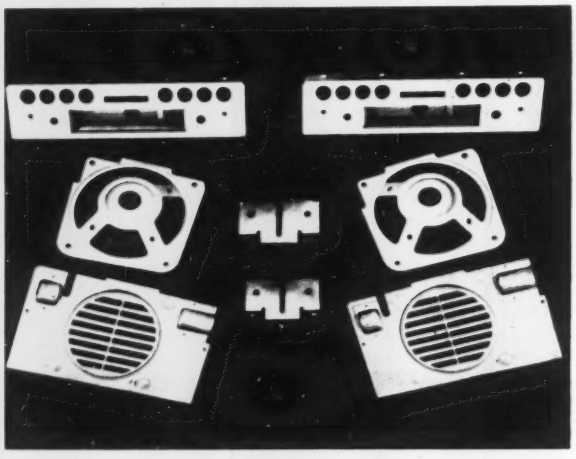


Appropriate control permits deposits of tin and zinc to any composition. Optimum range, for operating convenience, is 75 to 80 per cent tin, with balance zinc



Tin-zinc plated radio chassis parts provide corrosion resistance in a class with cadmium and zinc. Solderability, even after two years' storage, proves excellent

Plated Coatings . . .

DESIGNERS WEIGH TIN ALLOYS

Present ample tin supply leads to closer examination of its potential as an alloying constituent. Success is seen with lead, zinc, nickel, copper and cadmium

By DR. FREDERICK A. LOWENHEIM
Metal & Thermit Corp.
Rahway, N. J.

ON THE BASIS of present stages of development, tin is the most versatile alloying element available to the plater. About the only alloy plating processes not involving tin are brass, nickel-cobalt and some of the gold alloys. On the other hand, alloys of tin with copper, zinc, nickel, lead and cadmium have been plated commercially, and several others are in the laboratory stage.

The strategic tin stockpile apparently is in good shape and the market free of price control. With tin unrestricted, the true picture emerges: There is overproduction at today's demand level.

Electrolytic tin plate has to a great extent superseded hot dip, so a large share of the former market for tin is permanently reduced. Under such circumstances it appears appropriate to call to the attention of engineers and designers the possibilities of tin as an alloying constituent either major or minor to improve electroplated coatings.

Problem of Control — Plating methods for producing several types of tin alloy coatings have been worked out, many of them by the Tin Research Institute of England. Several more are in various stages of development. These alloys have properties not shared by any single metal.

When confronted with an alloy plating process the average plater's first reaction is to say, in effect: "Why? Don't I have enough trouble already, controlling my solutions to plate a single metal? Now you want me to control two at once!"

Extenuating Factors—This reaction is to some extent justified. It is true that control problems tend to increase in geometric progression as the number of metals codeposited increases. But the situation with many alloys is not really as bad as it sounds; there are many extenuating factors. The alloy plating processes discussed here actually are only a little more critical in control than the average single-metal bath.

Justification for considering alloy plating is that most easily platable metals have been deposited. Expansion and improvement must be sought in the direction of alloys, of discovering ways of plating the difficult-to-deposit metals, or of improving processes or properties for the standard metals.

Tin-Lead

Tin-lead alloys represent a case where no special effort need be made to equalize the deposition potentials of the two metals involved, since they are very close in the beginning. These alloys thus can be plated from simple acid baths. The only problem is to find an acid anion compatible with both metals. Here, fluoborate serves very well.

The tin/lead ratio can be varied almost at will by appropriate changes in bath composition; but typical is the 7 per cent tin, 93 per cent lead alloy plated from bath[1] in Table I.

Use in Bearings—Tin-lead alloy coatings are used where solderability is a prime consideration. They have found extensive application in

manufacture of bearings. For many uses the lead is considered to be a cheap diluent for the more expensive tin. Fluoborates are relatively expensive, and baths are limited in application by lack of throwing power comparable to conventional stannate solutions, as well as by more critical operating features.

Tin-Zinc

Tin and zinc are far apart in electrode potential. Thus the previously mentioned expedient of complexing agents is employed in formulating an alloy plating bath. The bath is essentially a mixture of conventional stannate tin solution and cyanide zinc solution. Both tin and zinc are in the form of complex ions and their activity in the bath is regulated accordingly by concentration of the complexing agent.

The tin is in the form of stannate, its behavior governed by the hydroxyl (caustic) concentration: $Sn^{++++} + 6\ OH^- \rightleftharpoons Sn(OH)_6^{--}$. The higher the OH^-, the lower the free Sn^{++++} and the lower the tin content of the deposit.

Zinc is present as both cyanozincate and zincate ions, so its behavior is a little more complex: $Zn^{++} + 4\ OH^- \rightleftharpoons Zn(OH)_4^{--}$; $Zn^{++} + 4\ CN^- \rightleftharpoons Zn(CN)_4^{--}$; $Zn(OH)_4^{--} + 4\ Cn^- \rightleftharpoons Zn(CN)_4^{--} + 4\ OH^-$.

Easily Regulated — Increase in cyanide content then tends to tie up more of the zinc as the cyanide complex, while increase of hydroxyl ties it up as zincate. But since zinc plates more easily from the zincate than from the cyanide complex, the effect of increasing OH^- is to increase the zinc content of the deposit and effect of increasing cyanide is just the opposite.

Thus in a mixed zinc cyanide-alkali stannnate bath the proportions of zinc and tin in the deposit can be easily regulated by control of bath composition, particularly the caustic and cyanide content.

By appropriate control, alloys of tin and zinc of any desired composition can be deposited. But extensive testing has shown that for most purposes optimum range from the standpoint of operating convenience and properties of deposit is 75 to 80 per cent tin, balance zinc.

Good Solderability—Tin-zinc alloys are useful as coatings because of a combination of properties rather than any single characteristic. Their corrosion resistance is in a class with zinc and cadmium, while their solderability is equal to or superior to that of tin. Tin coatings, particularly electroplated ones, have in some cases been criticized for lack of good solderability after storage or aging. Here the tin- zinc alloy scores high. Tin-zinc alloy platings have been found easily solderable even after almost two years' storage, with the use of only rosin fluxes or even with no flux at all.

Corrosion characteristics of the alloy prove particularly advantageous where dissimilar metals are in contact: Steel bolts in aluminum structures usually lead to early failure, but tin-zinc plating of the bolts overcomes this effect to a large extent.

Electronic Applications — Combination of properties possessed by tin-zinc alloys proves of particular interest in electrical and electronic applications. It is in these fields that this coating has found its principal use.

The process for plating the alloy is relatively simple and the bath has the desirable characteristic of good efficiency, excellent throwing power and relatively noncritical limits of operation.

Composition and conditions for the process are given in Table II[2].

Tin-Nickel

Alloys considered up to this point have been interesting for particular aspects of their performance rather than from an appearance standpoint. Neither tin-lead nor tin-zinc coatings would qualify as decorative finishes. With the tin-nickel, however, we enter the field of decorative-protective coatings. Tin - nickel alloy coatings offer some attractions in this field in addition to a new finish available to those desiring novelty. Its appearance is pleasing; throwing power and efficiency of the solution are excellent.

The alloy has excellent corrosion and tarnish resistance; it may be chromium-plated if desired. It is reasonably hard (between nickel and chromium); fairly ductile, though not sufficiently so to allow much fabrication after plating; completely stress-free; and easily solderable.

Stretches Nickel — Also to be considered in these days of nickel shortage which appears to be chronic: The tin-nickel alloy, consisting as it does of 65 per cent tin, 35 per cent nickel, enables the plater to stretch his limited supply of nickel almost three times.

Physical examination shows that

TABLE I
Tin-Lead Plating Bath

Stannous Fluoborate (as tin)	7.0 g/l
Lead Fluoborate (as lead)	88.0 g/l
Fluoboric Acid (free)	40.0 g/l
Free Boric Acid	25.0 g/l
Addition Agent: Glue	0.5 g/l
Anodes: Alloy	7-93 tin-lead
Current density	30 amp/sq. ft.
Temperature	60-100° F

TABLE II
Tin-Zinc Alloy Plating Bath

	Still Tanks	Barrels
Potassium Stannate	16.0 oz/gal	12.7 oz/gal
Potassium Cyanide (free)	2.8 oz/gal	2.0 oz/gal
Potassium Hydroxide	0.9 oz/gal	1.3 oz/gal
Zinc Cyanide	1.2 oz/gal	1.8 oz/gal

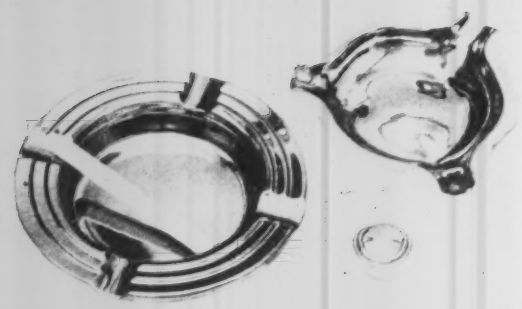
Alloy anodes 78 per cent tin, 22 per cent zinc, temperature 150° F.
Cathode current density 20 to 50 amp per sq. ft.
Anode/cathode ratio is 1.5/1.

TABLE III
Tin-Nickel Alloy Plating Bath

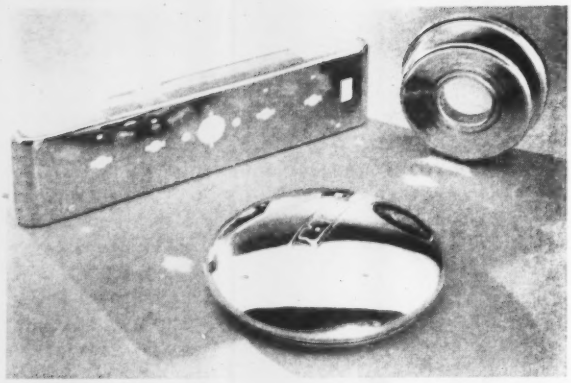
Stannous Chloride Anhydrous*	5.8 oz/gal
Nickel Chloride	10.0 oz/gal
Sodium Fluoride	3.75 oz/gal
Ammonium Bifluoride	4.67 oz/gal

pH 2.0 to 2.5 (Colorimetric)
Temperature 150° F

Anodes: Tin and nickel anodes on the same bus bar, bagged
Filtration: continuous preferred; frequent required, through activated carbon
Ventilation required
*Trade mark "Stannochlor" (R), Metal & Thermit Corp.



Among decorative-protective coatings, tin-nickel alloy electroplate offers pleasing appearance, good corrosion and tarnish resistance and can be chrome plated



Bronze electroplate is good base for chrome plating. Its corrosion behavior is similar to nickel in many environments. New processes promise practical production

the plated alloy is the intermetallic compound SnNi, a phase which does not appear on the thermal equilibrium diagram and has been produced only by electrodeposition. It is stable at room temperature, but on heating to about 400 C appears to break up into the two phases Sn_2Ni_3 and Sn_4Ni_3, so the alloy plate cannot be recommended for high-temperature service.

Process for plating tin-nickel utilizes a fluoride-chloride bath of the composition given in Table III[3]. Materials of construction must be such as will withstand hot acid fluoride solutions. Most rubbers and plastics of low filler content, and pure nickel, are suitable. The process is most easily controlled by a Hull cell and similar plating tests coupled with regular analysis.

Tin-Copper

Here we return to the stannate-cyanide type of solution, where tin activity is controlled by the hydroxyl concentration and copper by the cyanide content. Tin forms no cyanide complex and copper no hydroxo complex, so there are no cross-effects and the situation is even simpler than in the tin-zinc process.

Tin alloys easily with copper at all concentrations. Two ranges are of particular interest from a plating standpoint: The 45 per cent tin alloy known as Speculum and the bronzes in 10-20 per cent tin range. Speculum plating was introduced several years ago by the Tin Research Institute.

Attractive Substitute — Recently alloys containing 10 to 20 per cent tin 12 per cent being the apparent optimum have received considerable attention. Plating these bronzes is by no means new. Bronzes have been used for some years as standard coating for stopping-off of steel before nitriding.

Recent revival of interest in bronze plating can be traced to the nickel shortage. As one nickel substitute after another is proved wanting, the fact that the corrosion behavior of bronze is very similar to that of nickel in many environments is attracting attention.

Limited tests have indicated that bronze may prove to be an acceptable substitute for nickel in many applications, except of course for its color.

One reason that bronze plating has not already been more widely used by the trade is that previous processes, while well enough suited to the small scale nitriding use mentioned, were not conveniently adaptable to routine large-scale production. Recent improvements have changed the situation and now at least two processes one an English development[4] and the other by the Metal & Thermit Corp.[5] appear to be practical in all essential respects.

Serviceability — Bronze plating for decorative-protective service has not been as thoroughly tested as the tried and true copper-nickel combination, so it cannot be stated with certainty that it is as good as or better than that system. But there are good indications that bronze-chromium compares favorably with copper-chromium lacquer both in case of production and in serviceability. Bronze is only a little more expensive than copper and about as easy to plate and control.

The solution is basically a simple copper cyanide-alkali stannate bath, and no complications are encountered in its use or control. Other (proprietary) solutions are also available for plating this alloy.

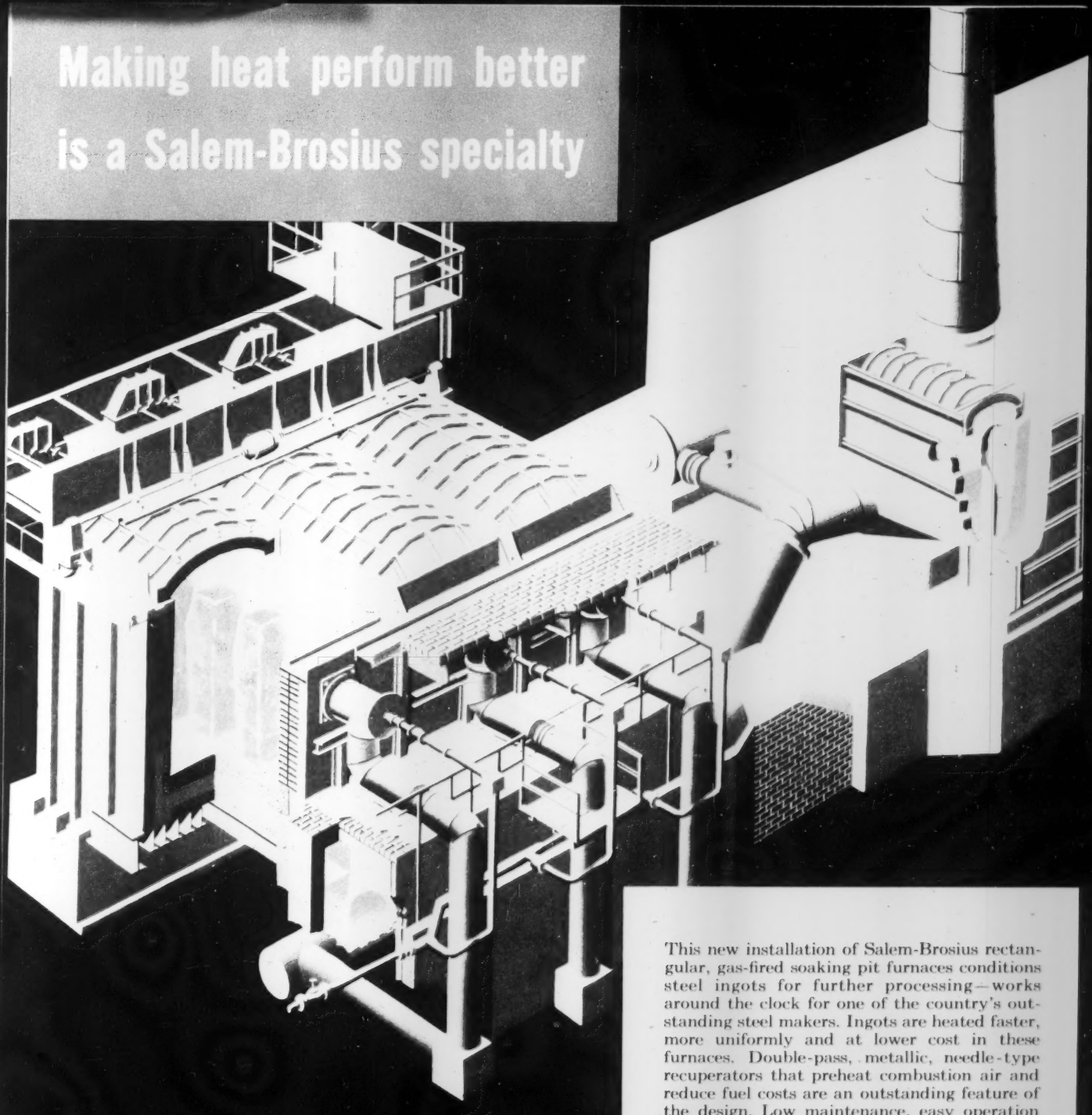
Tin-Cadmium

Cadmium is, of course, excellent for salt-spray and strictly marine exposure conditions. Addition of about 25 per cent tin, either as a duplex coating subsequently heat-diffused or as an electrodeposited alloy is said to increase its corrosion-resistance to a remarkable degree. The alloy can be plated from a fluoborate solution[6], and some work has been done on other types of baths.[7]

Limited published information is available on plated alloys of tin with silver and with gold. Preliminary development work has been reported on tin-antimony alloys.[8]

(1) General Chemical Co. Technical Information Manual LTF—1.
(2) Metal & Thermit Corp. Tech. Data Sheet 107.
(3) Metal & Thermit Corp. Bulletin No. 300.
(4) "Nickelex". Silvertown Ltd. G. Schmer ings: Electroplating, April 1952, p. 115.
(5) F. A. Lowenheim, to Metal & Thermit— U. S. pat. 2528601 (1950).
(6) R. D. Gray and W. A. Pisecht, to Curtiss-Wright Corp. U. S. patent 2605238 (1952).
(7) P. S. Bennett: J. Electrodepos. Tech. Soc. 26, 91 U. S.
(8) J. S. Cuthbertson and N. Parkinson—J. Electrodepositors' Tech. Soc. 28 (preprint) (1952).

Making heat perform better is a Salem-Brosius specialty



This new installation of Salem-Brosius rectangular, gas-fired soaking pit furnaces conditions steel ingots for further processing—works around the clock for one of the country's outstanding steel makers. Ingots are heated faster, more uniformly and at lower cost in these furnaces. Double-pass, metallic, needle-type recuperators that preheat combustion air and reduce fuel costs are an outstanding feature of the design. Low maintenance, easy operation and long service life are standard with Salem-Brosius designed furnaces.

Salem-Brosius engineers are specialists in performance and control of heat in manufacturing, offering furnaces custom-built to your requirements. Salem-Brosius furnaces assure you maximum high-quality output at minimum initial, operating, and service costs.

We would like to tell you more about the efficiency of these new units, and also about the well-known Salem-Brosius circular soaking pits.

If your modernization or expansion plans call for heating or heat treating furnaces of any kind, furnace charging or forging manipulation equipment, valves, or hot materials handling machinery; write, wire, or phone Salem-Brosius!

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all Industry

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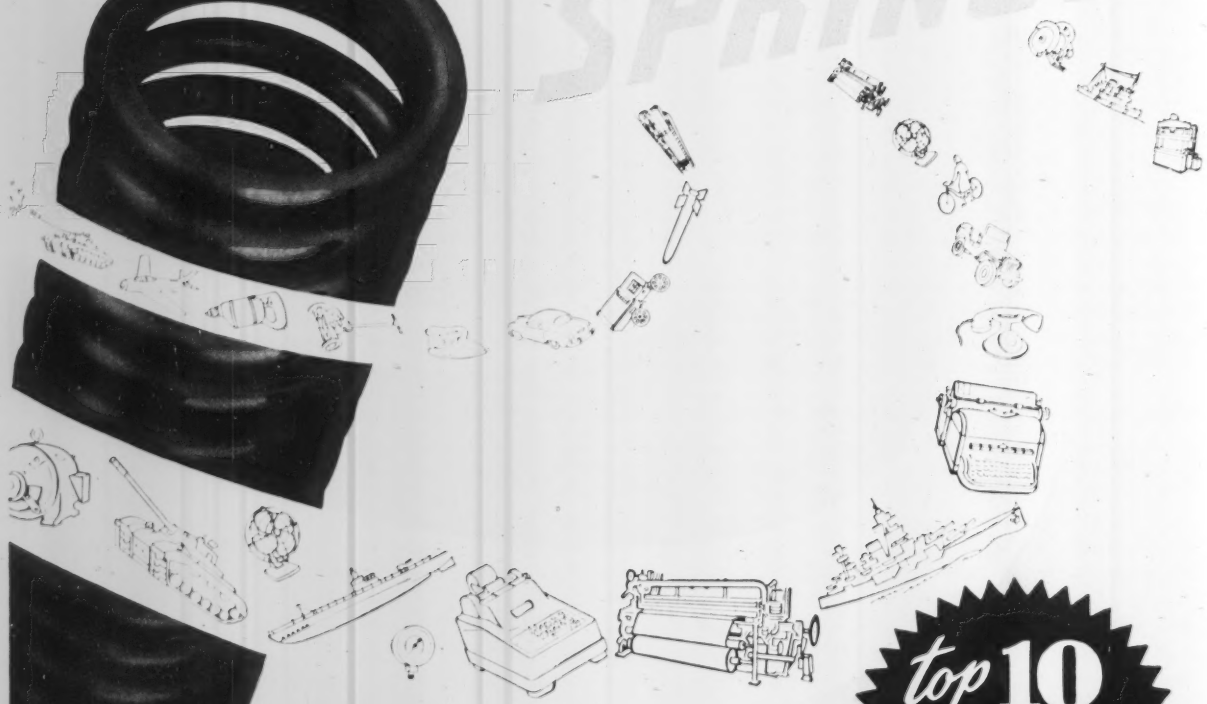
SPRINGS



All Industry turns to the

top 10 SOURCES for Mechanical Springs

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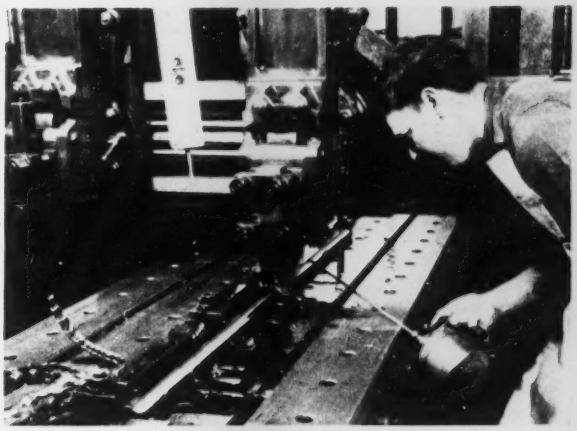
DIVISIONS OF
ASSOCIATED SPRING CORPORATION

IN CANADA - The WALLACE BARNES CO., Ltd., Hamilton, Ontario

Bar feed tube has 1-9 16-inch inside diameter. Parts above are tube components with assembled tube at left



Section being planed forms the cover of the stock bar feed tube. Parts are straightened to within 0.005-inch

Feed Tubes Cut from Square Stock

Square and rectangular bars are machined from the solid to become components for bar feed tubes. Design and manufacturing problems dictated the method

SQUARE-SHAPED bar feed tube adds to the capacity range of bar feeds made by Lipe-Rollway Corp., Syracuse, N. Y.

Round tubes on early models were satisfactory except they limited the range of stock sizes that could be handled. Seamless tubing did not lend itself to the manufacture of their bar feed tubes, chiefly because of tolerance and surface finish problems.

First System—Originally, round tubes were made from 1⅞-inch diameter solid bars requiring rifle drilling, turning and reaming. Mounting pads were welded to each tube section to give rigid support when bolted to the magazine actuating mechanism.

After each pad was welded it was milled to keep the bore center dimension from one end of a tube section to the other in perfect alignment. Because welding had a tendency to distort the tube sections, a straightening operation was necessary.

Finally, each tube section was sawed and milled to produce the bottom and cover sections of the stock bar feed tube.

Assembled Unit — New square tube is made from three square and rectangular bars. After the bars are cut to length and stress relieved, they are straightened to within 0.005-inch.

A milling or a planer operation partially forms the surface of the bore in each of these three sections of stock bars. The sections are then assembled and drilled, tapped and counter-bored as required. In the smaller models, two sections are welded together, leaving the third section for the cover.

Dovetail grooves are milled on these units to act as guides for the clamp supports when the complete stock bar feed tube is assembled and bolted to the magazine actuating mechanism.

Magazine Load—Bar feed is actuated by air valves and cylinders. Stock bars are racked in the magazine along one side of the split stock bar feed tube or housing, the lower half of which slides backward to receive the bottom stock bar from the magazine.

Lower half of the stock bar feed tube, carrying the bar, moves forward into position, closing the bar feed tube. A stock pusher, inside this feed tube, moves the bar into the spindle and collet machine.

With the three new models, total bar feed range is from 1/16 to 1½-inches in diameter. Feeds, originally designed for single spindle automatic screw machines, are also used on saws, cutoff machines, punch presses and centerless grinders.

Clad Metals Study Offered

"An Introduction to Clad Metals," reported to be the first publication to cover this important field, has been announced by Superior Steel Corp., Carnegie, Pa.

Written by Walter L. Keene, Superior's director of research, it offers a comprehensive survey of the manufacture and application of the stainless, copper, brass and other clad steels. Topics include an introduction, definition, principles of bonding, characteristics of clad metals, methods of cladding and applications. The booklet is profusely illustrated and shows the basic equipment and processes used in varied cladding methods.

Ahead of Schedule! Four million tons a

Now completed, in the heart of a vast industrial area, are facilities that increase Great Lakes Steel's annual capacity to *four million ingot tons*. That's about 25% of the automotive industry's annual appetite for steel, and about 40% of its appetite for the kinds of steel we make.

So this growth of Great Lakes Steel—weeks ahead of schedule—means a great deal not only to us but to our principal customer, too.

Our new facilities—new blast furnaces, the new bessemer converters, the new slabbing mill, and the rest—all fit into a program established long ago, when the company was founded. The program called for Great Lakes Steel to provide the automotive industry with a dependable first source of sheet, strip and other shapes for this industry's mammoth needs. And that's just what we've been doing.

We start with the ore, and work it through blast furnaces, bessemers and open hearths, blooming mills, hot and cold rolling mills and merchant mills, right down to the finished forms. This integration of control gives Great Lakes Steel the flexibility and availability that let us give real service.

Not just another steel supplier, Great Lakes is also a *developer* of steels now important to industry—N-A-X HIGH-TENSILE steels, which combine extra strength, formability, and corrosion-resistance, enabling manufacturers to make improvements in many parts.

You can expect more great things to happen at Great Lakes Steel. For we aim to serve well our many customers in many fields, while keeping pace with the increasing needs of the mighty automotive industry. *Great Lakes Steel Corporation, Detroit 29, Michigan.*

Great Lakes Steel

NATIONAL STEEL CORPORATION

GREAT THINGS HAPPEN AT GREAT LAKES STEEL

year to supply industry

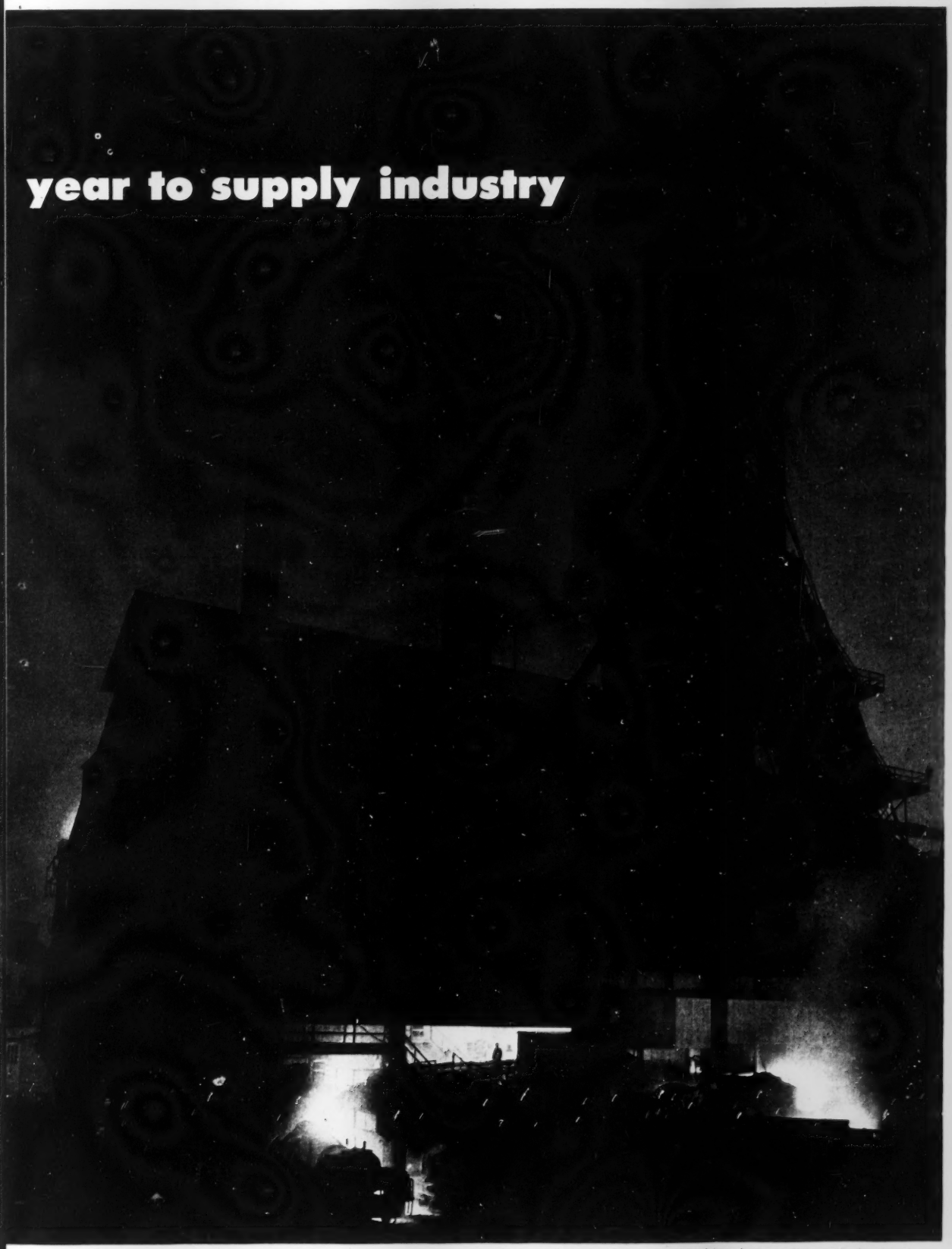


Illustration: New "D" blast furnace, Great Lakes Steel

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Expanding Two-Way Radio

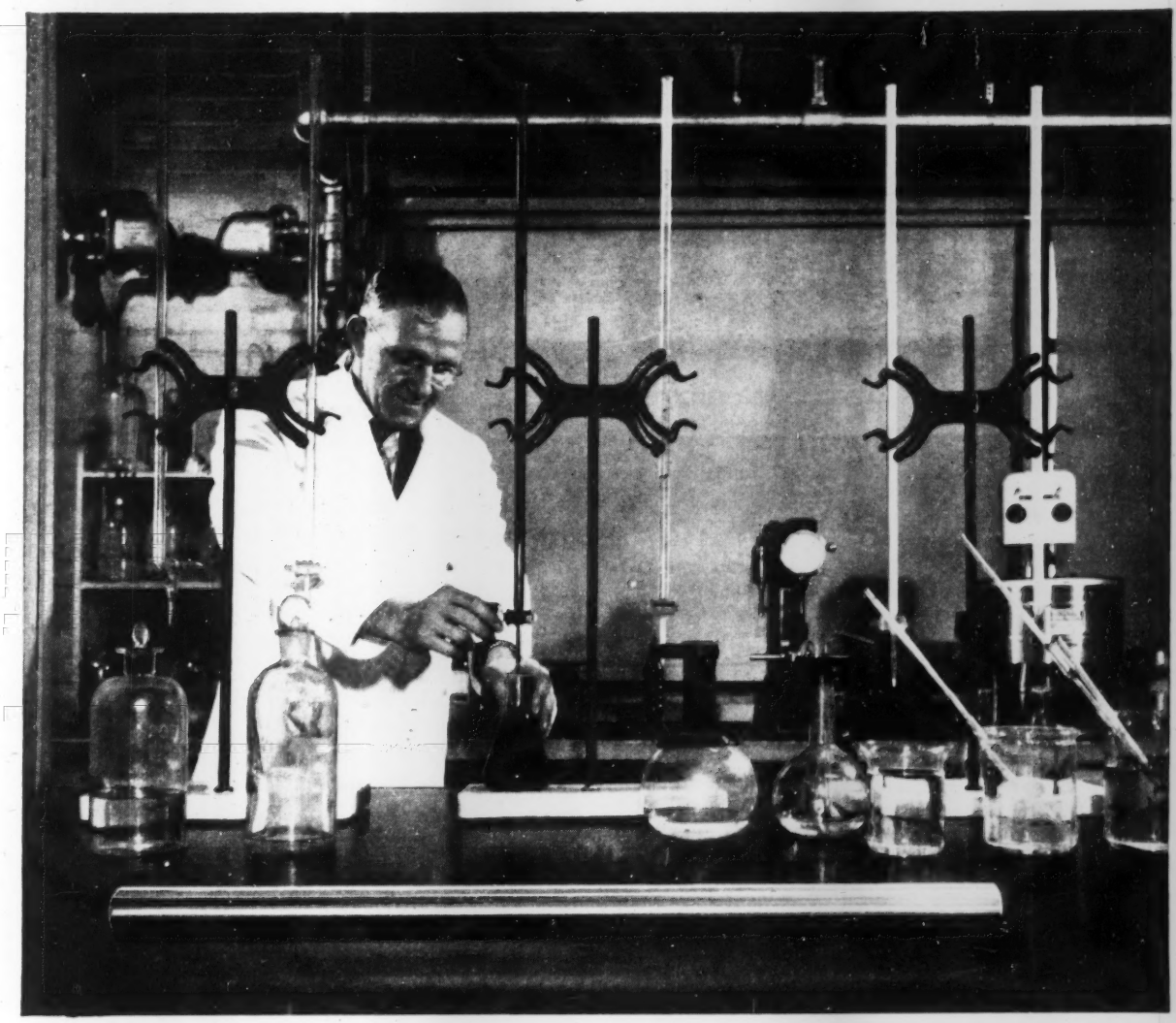
NAM group goes to Washington to plug relaxation of frequency limits in plant application

In support of the campaign for additional frequencies for the operation of two-way radio systems in manufacturing plants, President William E. Umstattd, Timken Roller Bearing Co., took a shop crew to Washington last week to demonstrate to the Federal Communications Commission how this medium is used in operating a steel plant.

Model Mill—They set up a scale model of a mill complete with straddle trucks, fork lift trucks and other mobile units—all radio-equipped and governed from a radio control station. With the aid of William V. H. Moore, Thompson Products Inc., as narrator, the team showed how the use of radio reduces from days and hours to minutes the time required to feed billets to the mill, transfer finished product to the shipping department, etc. Highlights were the use of radio for fast attention to an injured driver, quick repair of a damaged railroad switch, replacement of a crippled truck, etc.

The move for more frequencies for such uses is being pushed by the Committee on Manufacturers' Radio Use, National Association of Manufacturers, comprised of: Chairman, Herbert E. Markley, Timken Roller Bearing Co.; Victor G. Reis, Bethlehem Steel Co.; Eugene E. Ford, Thompson Products Inc.; William V. H. Moore, Thompson Products Inc.; and Richard Thuma, Allis-Chalmers Mfg. Co.

More Frequencies Needed—"The frequencies presently available to manufacturers are shared, not only by other manufacturers, but by various other kinds of business," said Mr. Markley. "As these shared frequencies become overloaded, the advantages of radio will rapidly disintegrate, and this is the prospect now facing the manufacturing companies. The committee also feels that the fullest use of two-way radio cannot be obtained unless companies are freed from the present rules confining their radio systems to narrow in-plant limits, thus preventing contact with company vehicles outside the plant and the development of important inter-plant communication system."



Here's how we measure the "Muscle" in an Alloy Bar

Columbia alloy bars have muscle—and plenty of it. It's the kind of uniform strength that our many customers have learned to rely on, because each alloy bar is made to the same exacting standards as the last.

Only specially selected raw material is used. This material is subjected to a continous series of tests (like the one shown above) to verify its exact metallurgical content. What's more, each step of our production is rigorously Quality-Controlled by our laboratory to produce alloy bars that you can use in *your production* with minimum treatment and waste. ● More product information —technical assistance, too—are yours for the asking. Call or write today.

Columbia STEEL & SHAFTING COMPANY

Pittsburgh 30, Pennsylvania

SPECIALIZING IN COLD FINISHED STEEL BARS and SEAMLESS STEEL TUBING

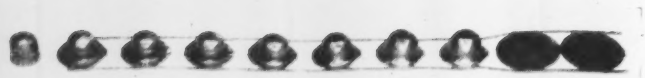
THE JOBS PROVE IT

YOU RETRENCH ON STAMPING COSTS WITH HENRY & WRIGHT DIEING MACHINES

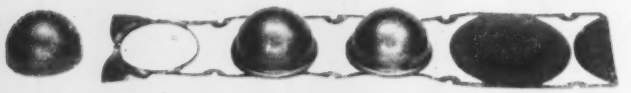
In the small area occupied by a compact Henry & Wright Dieing Machine you have a production tool equal in capacity to five or ten conventional presses. Progressive stamping on a Henry & Wright really pays off, because this press is specifically designed for this type of work.

Angular thrust is not transmitted to the upper crosshead. Low center of gravity holds vibration to an absolute minimum. Long ways, plus four post guidance and a pulling instead of pushing stroke, serve to strait-jacket punch travel. Accurate punching produces high quality work and a lot more of it between die grinds. Much less metal is removed when dies are ground.

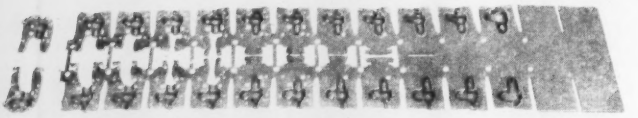
Get the whole story about the Henry & Wright Dieing Machine—the economies you achieve in die life, inspection, toting, operators. Retrench by modernizing with Henry & Wright.



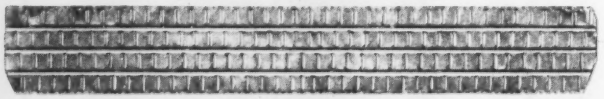
Refrigerator part produced at speed of 65 strokes per minute of .060" cold rolled steel on 100 ton Dieing Machine.



Hemispherical shell 2" deep produced at speed of 60 strokes per minute.



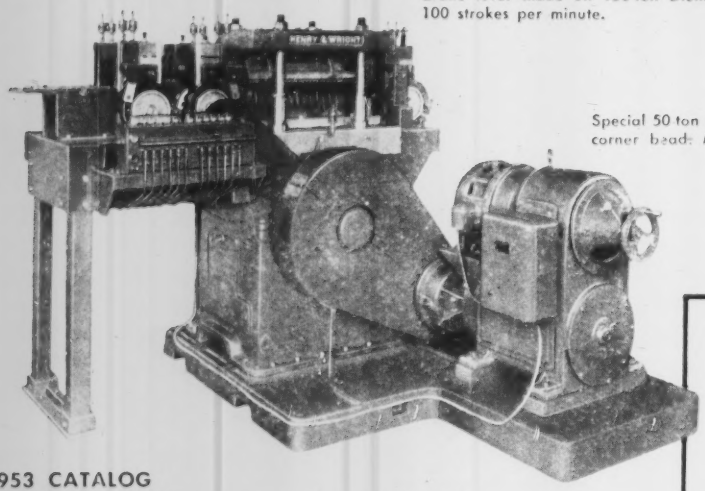
Paired sections of housing produced of .065" hot rolled steel at 60 pairs per minute.



Radiator fin of copper made three at a time at speed of 85 strokes per minute.

Radio part produced one per stroke at speed of 300 strokes per minute.

Brake lever made on 150 ton Dieing Machine operating at speeds in excess of 100 strokes per minute.



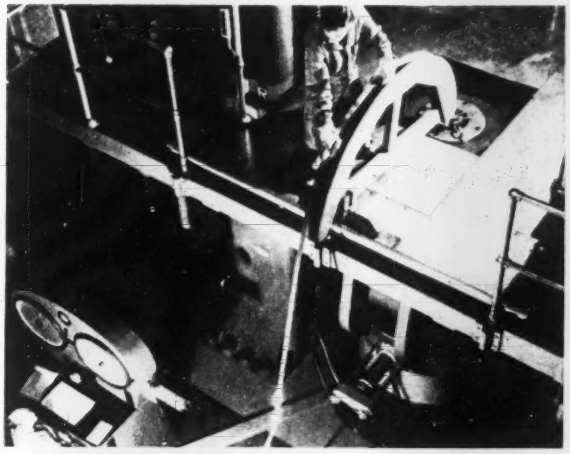
Special 50 ton dieing machine for production of expanded corner bead. Machine operates 620 strokes per minute.

1953 CATALOG

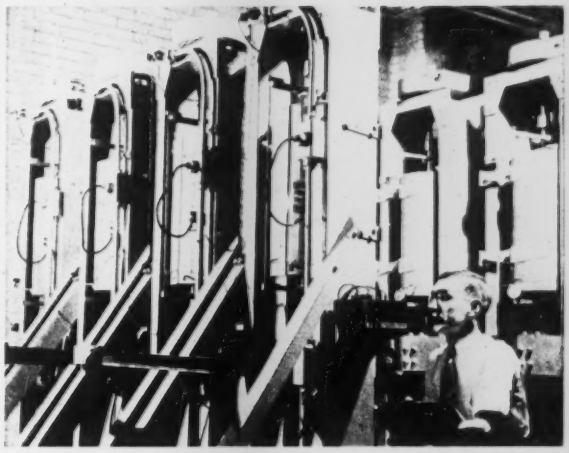
Write for your copy on company letterhead to Henry & Wright, Division of Emhart Mfg. Co., 441 Windsor St., Hartford, Conn.

HENRY & WRIGHT

DIVISION OF EMHART MFG. CO.



Precision metalworking machine at New Kensington is versatile. Here it is extruding an aluminum shape



Creep test apparatus shown above measures the increase in length of the aluminum alloy specimens under a load

Aluminum oxide is converted to tabular alumina by heating to near the fusion point at East St. Louis plant

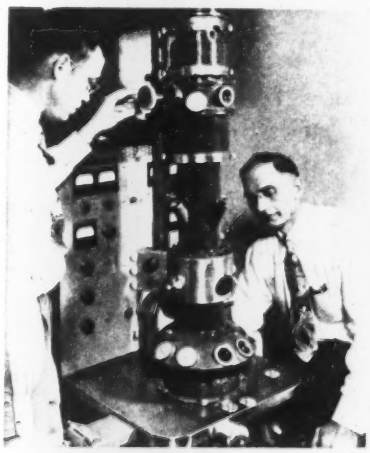
Research:

ROAD FROM IDEA TO PRODUCT

WORKING definition of the role research plays in the over-all plan of a progressive industry is evidenced in the setup employed by the Aluminum Co. of America.

Hub of activities is at New Kensington, Pa., where 11 of 14 divisions are quartered. Work on alumina and chemicals is conducted at East St. Louis, Ill.; casting and forging at Cleveland; and electrical conductors at Massena, N. Y.

Divisions at New Kensington include: Analytical chemistry, chemical metallurgy, engineering design, lubricants, mechanical engineering, mechanical testing, metallography, paint finishes, physical chemistry, physical metallurgy and process metallurgy.



Electron microscope at East St. Louis was one of first in U.S. It can magnify up to X 100,000

Alloy specimens undergoing heat treating tests are loaded into pit furnace at Cleveland lab

Researcher is making preparations to x-ray a cast aluminum cylinder head at the New Kensington lab

9-Stage progressive dies are used to blank, form, pierce and trim. Feeding and scrap cutting (scrap delivered to tub at side of press) is fully automatic. Piece parts are blown by air up rear delivery chute and onto conveyor for delivery.

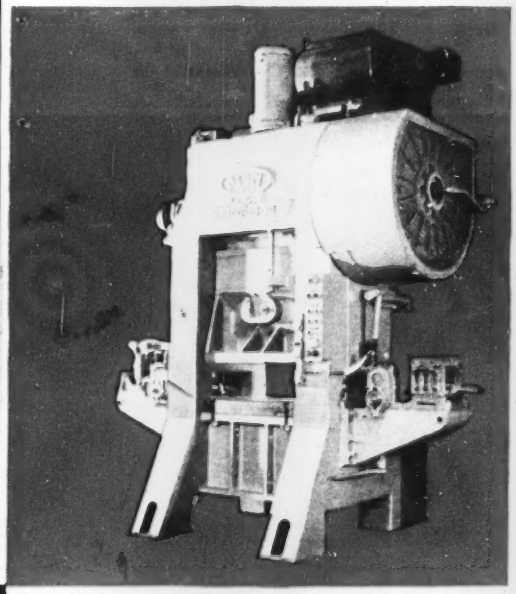
DANLY®

MECHANICAL PRESSES...50 TO 3000 TONS
HYDRAULIC METALWORKING EQUIPMENT

How can you get

high operating efficiency

on high production jobs?



Longer die life . . . continuous high-speed operation of the Danly Autofeed Press makes the die investment pay off in production efficiency... precision press features assure added alignment accuracy and greatly lengthened die life.

A Leading Automotive Parts Manufacturer DID IT on their

DANLY PRESS

Selecting the right press for an intricate die set-up was a difficult problem facing a leading producer of automotive parts. Needed was a *high production* press built for rigidity and precision to extend the life of costly 9-stage progressive dies and improve piece part quality.

What press was specified? A Danly 100-ton Autofeed Press *more than met every requirement* with a remarkably high record of *operating efficiency!* Running full automatic almost continuously through 2 shifts daily, this Danly stamps automobile thermostat valve seats at a rate of 125 strokes per minute. Since installation no major maintenance has been required . . . cutting "down-time" losses, permitting steady, uninterrupted production.

Danly Presses have solved this problem for leading stamping shops across the country . . . and can do the same for *you*. Write for free Danly Autofeed Press Booklet and get the details.

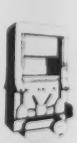
DANLY MACHINE SPECIALTIES, INC.

2100 South Laramie Avenue, Chicago 50, Illinois

PROVED AGAIN... *It costs less to run a DANLY PRESS!*

Single Action Straight Side

Autofeed



Underdrive Single, Double, Triple Action

Gap Frame

Double Action Straight Side

World's Largest Builders of World's Largest Cranes

Alliance...

FIRST IN SIZE! FIRST IN CRANE DESIGN!

LOOK AT THE FEATURES OF THIS NEW CRANE!

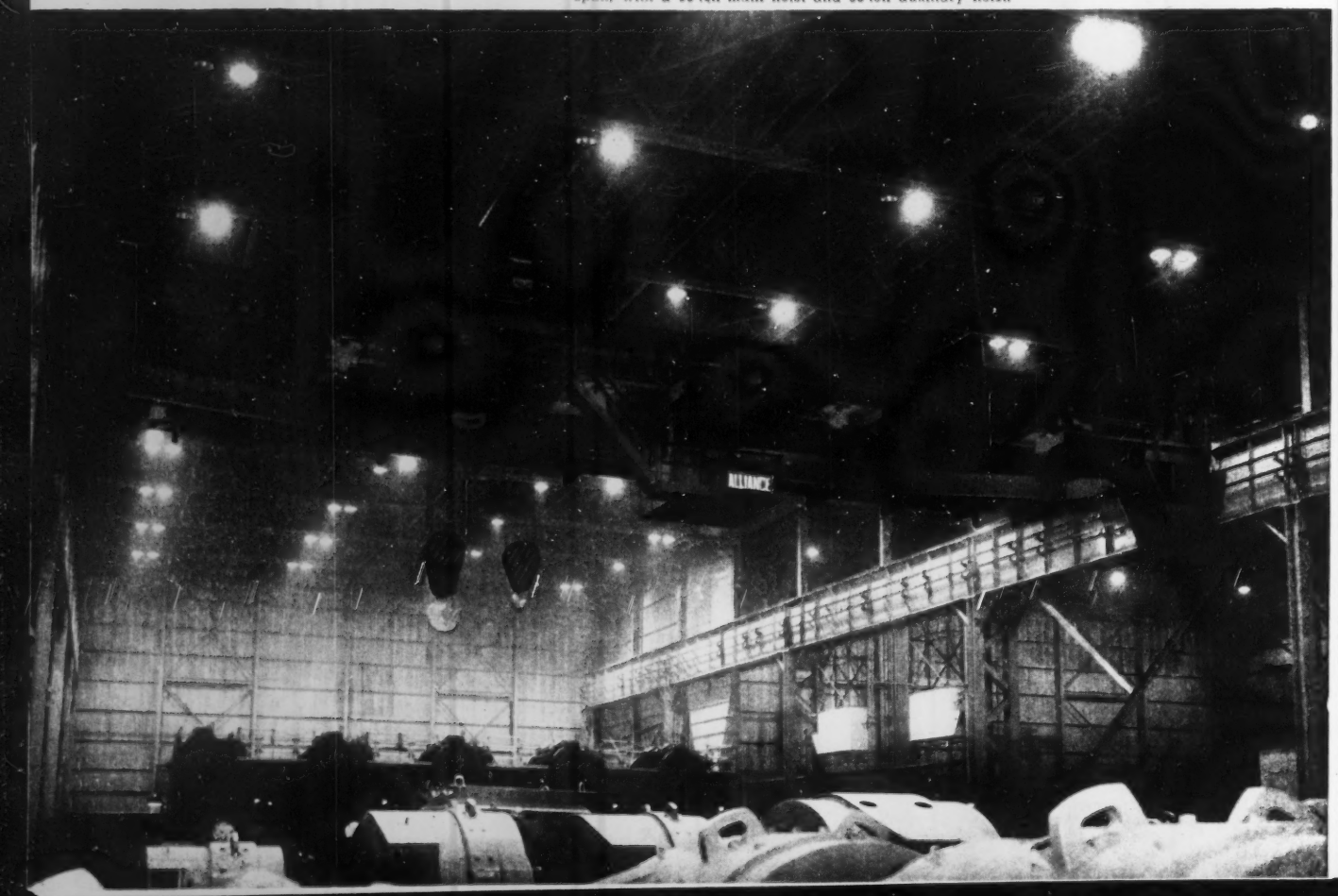
- **Working parts easily accessible for quick maintenance.**
- **Adequate end bracing and large gusset plates keep crane square and girders plumb.**
- **Liberal safety factors . . . girders, ropes, bearings, gearing, motor sizes.**
- **Sealed lubrication on all roller bearings.**
- **Enclosed controls keep out mill dirt and, as located on foot walk, provide maximum accessibility.**
- **Operation easily and accurately controlled. Operator's cab located at center of bridge gives best visibility.**
- **One-piece welded trolley frame.**
- **All-steel construction including cast steel drums.**

For over half a century leading mill designers and builders for heavy industry have turned to The Alliance Machine Company for dependable heavy-duty cranes. Alliance has constantly pioneered mechanical features which are accepted today as conventional. Alliance can develop equipment best suited to your company's particular heavy material handling needs. Write for full information.

THE ALLIANCE MACHINE COMPANY

MAIN OFFICE • ALLIANCE, OHIO • PITTSBURGH OFFICE • OLIVER BUILDING, PITTSBURGH, PENNSYLVANIA

Alliance Standard Steel Mill Crane in the Cold Strip Reduction Department of the Fairless Works, U. S. Steel Corporation. This standard overhead crane has a 100-ft. span, with a 90-ton main hoist and 30-ton auxiliary hoist.



NEW PRODUCTS and equipment

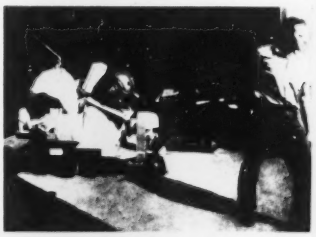
Reply card on page 131 will bring you more information on any new products and equiment in this issue

Cutoff Machine

. . . moves throughout the plant

Portable Radiac abrasive cut-off machine can be mounted on a hand or powered truck and conveyed throughout the plant for production or miscellaneous cutting jobs. Type P Traveler is used for dry cutting with either a bonded or rubber bonded abrasive disc.

Machine is suitable for cutting steel tubing or cast iron pipe up to 4 inches OD and most solid metals up to 2⅝-inch OD. Small structural shapes may also be cut within the vise capacity. An angular depth adjuster is provided to prevent abrasive disc from cutting



into the vise. A. P. De Sanno & Son Inc., Dept. ST, Phoenixville, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Strip Coil Splicer

. . . adapts to continuous work

Automatic coil end-splicer, adaptable to continuous operation involving strip, permits coils to be end-welded supplying a constant strip flow. Splicer is also valuable for buildup to large, multiple-length coils.

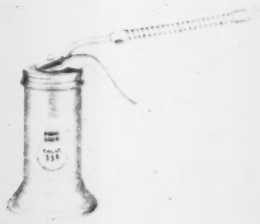
Essential to design of the splicer, called Weld-a-matic, is ability for rapid production of a slim contoured weld that is stronger than the parent metal and so flat that it rolls perfectly without trimming. Welds can be produced satisfactorily on carbon, stainless, silicon, aluminum, copper and brass. Arms-Franklin Corp., Dept. ST, Youngstown 1, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

All-Purpose Pump Oiler

. . . reaches awkward places

This 6-ounce pump oiler with asbestos-lined steel cone-shaped spout has capacity to deliver oil in



a full stream or one drop, through its hydraulic action. Unit has seamless drawn steel body, double-seamed bottom and copperite finish.

Flexible steel spout allows user to reach awkward places. Pump mechanism contains no leathers and no soldered connections. All parts are replaceable. Eagle Mfg. Co., Dept. ST, 2554 Charles St., Wellsburg, W. Va.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Marking Crayon Stands Heat

. . . won't fade from metal

Complying with demand for a special marking crayon whose marks will withstand heat generated by acetylene torches, this crayon is a mined product of natural soapstone, known as No. 530. It gives same distinct marking as pressed talc and gum crayons, but has added feature of not fading from metal to which extreme heat is applied. Crayons are ideal for use by layout men and pattern men for marking on rough steel plates and cast iron. Joseph Dixon Crucible Co., Dept. ST, Jersey City, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Right-Angle Drive

. . . has explosion-proof motor

For locations where dangerous fumes, inflammable gases or combustible dusts may exist, this right-angle Synerogear drive with explosion proof motor complies with Underwriter's specifications. Available in 1-hp rating, with speeds from 45 to 155 rpm, its three-phase alternating current motor is designated type SESV-GW by the manufacturer.

Unit incorporates cantilever design to protect gear alignment.

Mounting stresses are absorbed by one-piece base, freeing gear and motor housing of distortion. U. S. Electrical Motors Inc., Dept. ST, Box 2058 Terminal Annex, Los Angeles 54, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Electronic Air Cleaner

. . . pushbutton wash cycle

Air-cleaning unit, the PX Precipitron, combines 90 per cent cleaning efficiency with simple pushbutton method of spray washing. Result is reduced maintenance

cost and elimination of inside-the-duct cell washing.

Accumulated dirt on the electronic collector-plate surfaces is flushed away by penetrating hot water from needle-spray nozzles attached to a motorized header. After moving across the unit's face, the header reverses automatically and returns to the starting position.

Same header applies adhesive oil to collector-plate surfaces when washing is completed. Oil binds collected dirt together and acts as a solvent for the wash operation. Westinghouse Electric Corp., Dept. ST, Hyde Park, Boston 36, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

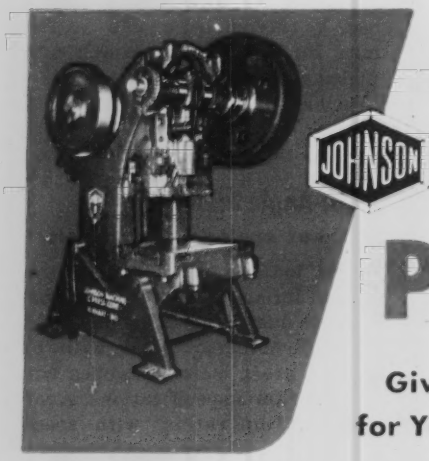
Phenolic Resin Line

. . . improves protective coatings

Line of phenolic resins, based on R-108 chemistry and imparting excellent chemical resistance to protective coatings, is known as 75120 and 75121 Methylon. Family of coating intermediates and resins has a wide range of compatibility with resins commonly used in the finishing field.

Not finished coatings in the generally-accepted sense, the resins are converted into a wide variety of finishes by coating formulators. Film-forming in themselves, they are capable of producing coatings that are highly resistant to corrosive and oxidizing agents. General Electric Co., Dept. ST, Pittsfield, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7



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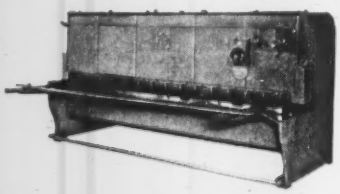
the HYDRA-SHEAR



Will increase your production to a new high. Will shear mild steel up to 10 gauge in three lengths: 6, 8 and 10 feet. Less curl and burring. No gears or clutch.

Johnson MACHINE and PRESS CORP.
620 WEST INDIANA AVENUE • ELKHART, INDIANA

Protecting Dust Hood

. . . weighs only 5 ounces

This dust hood is lightweight, easy to wear, weighs only 5 ounces. Its function is to keep the worker under cover in places

where nuisance dusts are present. Made of lightweight cloth, with a large picture window, it offers full unrestricted vision in all directions.

The hood can be worn with a respirator. General Scientific Equipment Co., Dept. ST, 2700 W. Huntingdon St., Philadelphia 32, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

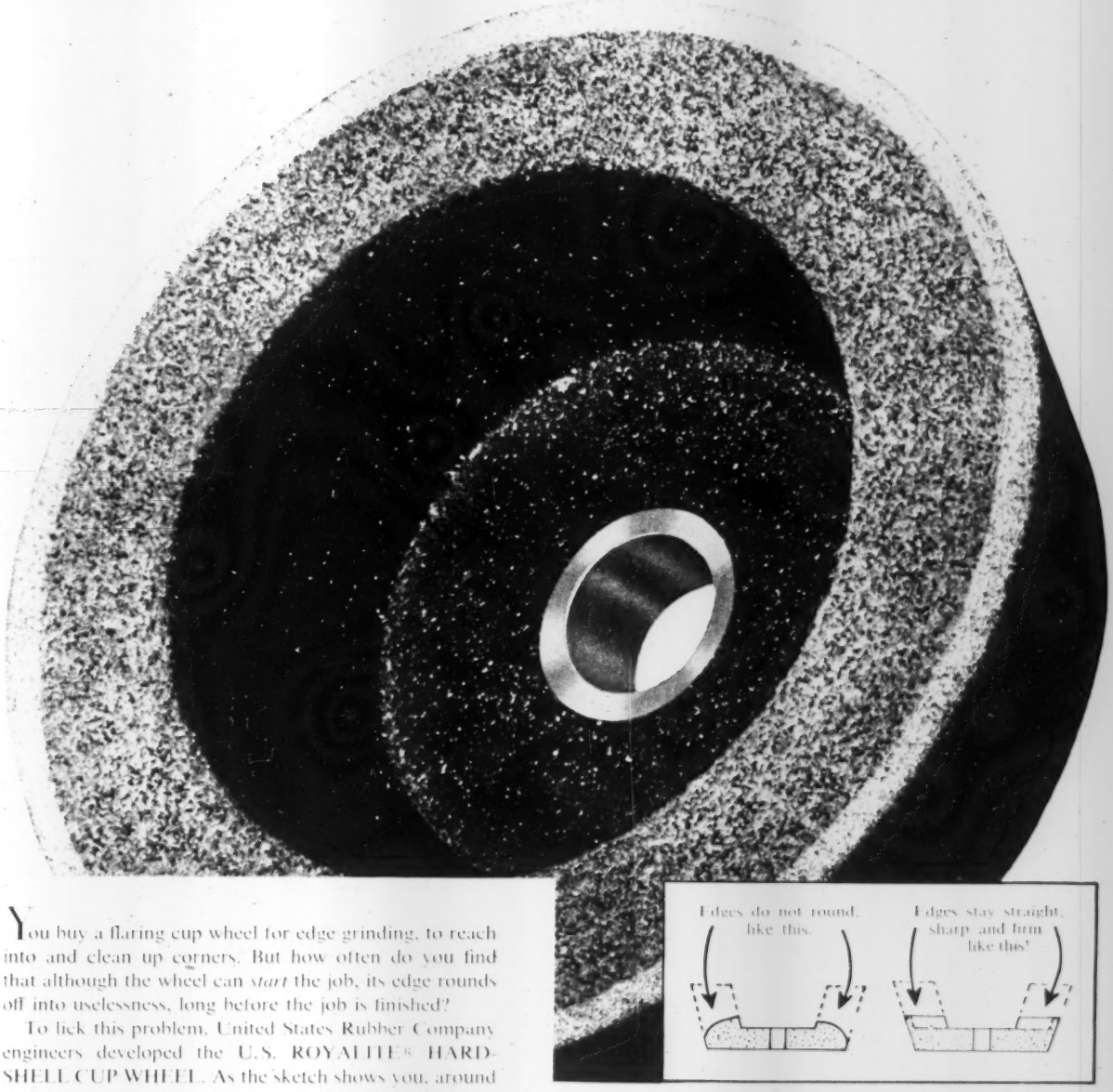
Hand-Operated Roller

. . . capacity to 24-gage sheet

Addition of six models to this hand operated roller line increases material capacity and forming width. These models have capacity from 16 to 24-gage sheet steel, forming width range of 12 to 42 inches, radius capacity from 2 inches up.

Rollers incorporate cam-idler

This U.S. Wheel cleans up the corners in edge grinding... it holds its sharp cutting edge



You buy a flaring cup wheel for edge grinding, to reach into and clean up corners. But how often do you find that although the wheel can *start* the job, its edge rounds off into uselessness, long before the job is finished?

To lick this problem, United States Rubber Company engineers developed the U.S. ROYALITE® HARD-SHELL CUP WHEEL. As the sketch shows you, around the free cutting edge of the Royalite Wheel is molded a tougher, longer-wearing rim. The sharp edge you want is there for the full life of the wheel.

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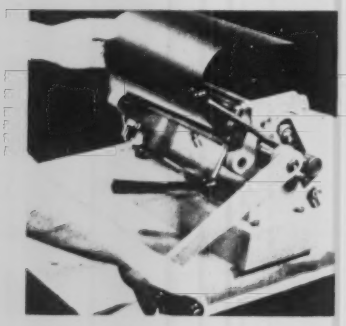
feature into their design to make it possible to form circles of any diameter in two passes. Circles of the same diameter as the forming rolls or slightly larger can be formed in one pass. Bends also can



be located in any position along a sheet of material being formed. O'Neil-Irwin Mfg. Co., Dept. ST, 619 Eighth Ave., Lake City, Minn.

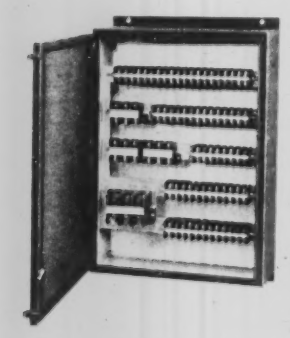
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Terminal Junction Box Line

. . . machine tool application

This line of terminal junction boxes, offered in NEMA type XII construction, is designed primarily for machine tool application. Boxes are available in eight standard sizes, the largest accommodating 168 twenty-five amp terminals. Fifty and one-hundred amp terminals can also be used in combination with the twenty-five amp units.

External mounting feet are provided and hinged door gasketed with sponge Neoprene, preventing



entrance of oil or coolant. Terminals are mounted on removable straps away from the back of the enclosure, insuring generous wiring space. Because knockouts are not provided, box can be entered as desired. Square D Co., Dept. ST, 4041 N. Richards St., Milwaukee 12, Wis.

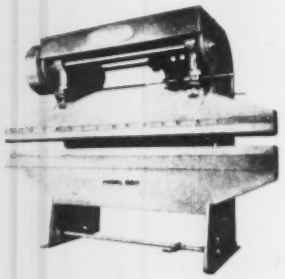
FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Expanded Press Brake Line

. . . bends 96 inches, 16-gage

Semco press brake, the 8 foot model 800, expands the manufacturers line to include a unit with bending capacity of 96 inches, 16 gage. Frame is one piece construction, normalized for strain relief and to insure accuracy.

Brake has 3-inch stroke, 4½-inch ram adjustment. Strokes per



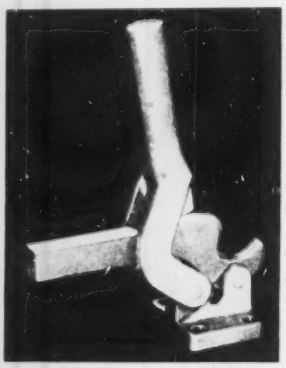
minute range from 16 to 40. Full ball and roller bearing construction throughout should insure long and effortless operation. Service Machine Co., Dept. ST, 492 Miller St., Elizabeth, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Fixture Cam Clamp

. . . variation without adjustment

These cam clamps maintain positive holding pressure and secure clamping action, even on such



varying stock thicknesses as are found in castings and forgings. They eliminate the need for adjusting hold-down bolts or other special accessories, because the surface makes allowance automatically for stock thicknesses varying as much as ⅛-inch.

Cam's heavy construction and precision assembly allow clamps to withstand severe vibration, making them applicable for many milling operations as well as usual clamping service. They are available in four standard sizes. Special Engineering Service Inc., Dept. ST, 8161 Livernois Ave., Detroit 4, Mich.

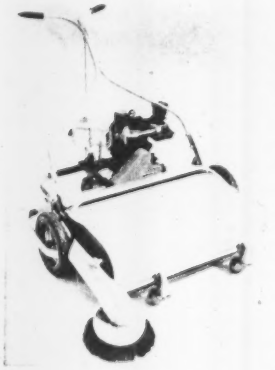
FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Fumeless Sweeper Attachment

. . . dissipates harmful exhaust

This line of Parker industrial sweepers is equipped with a catayltic exhaust attachment to eliminate harmful exhaust areas that should be cleaned mechanically, but where danger to employees is present.

The catalyst reduces dangerous carbon monoxide to a ratio of 0:0



at both idling and governed speeds. This means that a motorized sweeper can be used safely in confined areas. Attachment is available immediately as optional equipment. Oxy-Catalyst Inc., Dept. ST, Wayne, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Lens Cleaning Station

. . . no bottles, no pumps

This lens cleaning station eliminates bottles and pumps. Cleaning fluid includes antifogging properties and is packed in a pressure-packed can—1400 applications per can.

It is designed for operations

Millions of tiny alumina "bubbles" help block heat loss through this . . .

New Castable Cement—Good to 3100 F

Here's a castable cement that is also *one of the most refractory materials available.* Consisting of pure alumina bubbles and highest grade calcium aluminate, it is inherently inert, chemically stable, and will withstand temperatures up to at least 3100 F with practically no shrinkage. It is unaffected by furnace atmospheres and combustion gases. The hollow spheres of alumina make the cement one of the best insulating refractories for really high temperature work. It also follows that it is light in weight, and has low heat capacity.

These ALFRAX® BI aluminum oxide cements (there are actually three types) are particularly easy to install. You just mix with water and pour—like Portland cement. Linings can be put in with a minimum of labor and down time. And, once in, they stay in, even under conditions that quickly destroy other refractories.

For example, one manufacturer lines high temperature ducts (that are sometimes run at over 3000 F) with 3"-thick MULLFRAX® electric-furnace mullite shapes, and backs these up with 8" of ALFRAX BI cement. Cement shrinkage is practically nil, even at these temperatures. The cement stays free of cracks, and makes a durable monolithic lining that prevents seepage of high-pressure gases.

You have to experience comparative results to believe them. For full data on these castable cements and on other super refractories by CARBORUNDUM, use this handy coupon.

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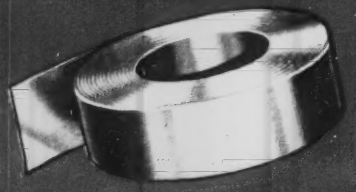

COLD ROLLED STRIP

Follansbee Cold Rolled Strip can be fed right from the coil into your high-speed presses with every assurance of smooth, trouble-free performance.

Custom-made in a wide range of tempers and finishes for virtually any automatic press requirement, Follansbee Cold Rolled Strip fits right into the production line.

Follansbee mill facilities assure a firm supply of custom-quality Cold Rolled Strip delivered from the mill directly to you for all your production needs.

Forming and stamping operations are never a problem with this highly desirable Cold Rolled Strip Steel. Just consult your trained Follansbee Steel Representative. He will be glad to discuss your fabricating problems with you.

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FOLLANSBEE METAL WAREHOUSES
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where antifogging fluid is necessary for plastic goggles, safety shields or any protective surfaces. Can is locked securely to steel

dispenser which contains no moving parts and feeds the interfolded wiping sheets. Silicone Paper Co. of America Inc., Dept. ST, 230 Park Ave., New York 17, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Specialty Lubricant

. . . dripless, wasteless type

Dripless, wasteless quality inherent in Non-Fluid oil is reported to eliminate oil showers from overhead machinery of all kinds, including cranes and motors. Result is reduced cleaning time, fire hazard and lower oil and application costs. Product is a specialty lubricant, applied on the basis of an individual job. New York & New Jersey Lubricant Co., Dept. ST, 292 Madison Ave., New York 17, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

High-Speed Punch

. . . design adds working surface

Series 4 Electropunch incorporates improvements in adjustment, operation and maintenance. It has same basic dimensions as previous series and, like them, delivers variable impacts up to 3500 pounds.

Design changes made in the base

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69. Precision Lathes

South Bend Lathe Works—Light Ten lathe, offered in both bench and floor types in quick-change gear and toolroom models, is subject of 12-page illustrated catalog 5216. Features are illustrated and specifications are given. Attachments and accessories are covered.

70. Pump Gear Drive

U. S. Electrical Motors, Inc.—8-page well-illustrated bulletin F-1775 describes Holloshaft gear drives to operate vertical turbine pumps where electricity is not available. Units are available in complete horsepower range, are fully water and weatherproof and feature positive cycling lubrication.

71. Screw Machine

Cleveland Automatic Machine Co.—2½-in. model AW single-spindle automatic screw machine is subject of 4-page illustrated bulletin. Its features, speed ranges and specifications are given.

72. Tap Selector

Threadwell Tap & Die Co.—Operating on the slide chart principle, pocket-size "tool" functions as a fraction size tap and machine screw tap selector. Necessary thread information is given. Tapping speeds and lubricants, tap limits and other basic data are included.

73. Carbide Tools

Super Tool Co.—Standard carbide tool catalog contains 92 pages of data, information, illustrations and use hints on such tools as milling cutters, end mills, reamers, drills, ejector tools, single point tools and miscellaneous tools. Reference is made easy by indexes and tables of contents.

74. Pipe Ratings

Pipe Fabrication Institute—"Pressure-Temperature Ratings of Plain End Pipe Used in Power Plant Piping Systems," is title of 28-page technical bulletin TB1-1953. It contains more than 5000 ratings calculated by revised formula and allowable stress values applying to ASA code for pressure piping and the ASME power boiler code. Ratings are arranged for easy reference.

75. Vapor Degreasing

Circo Equipment Co.—34 pages of detailed information on vapor degreasing found in this manual range from description of the processes to maintenance and trouble-shooting. Diagrams and cutaway photos are used. Operating instruction, installation and other data are included.

76. Pumping Problems

Geo. D. Roper Corp.—36-page handbook "How to Solve Pumping Problems" explains and illustrates operation of rotary gear pumps and presents three sample problems which show computations necessary to apply these pumps on representative jobs. Helpful charts and data relating to pump application make up balance of book.

77. Air Controls

Bendix-Westinghouse Automotive Air Brake Co.—Descriptions and applications of various Robotair industrial air controls for holding, clamping, bending and staking are found in the 16 pages of bulletin B-W 2005A. Selection charts, diagrams and accessories are detailed.

78. Alloy Steel Screws

Strong, Carlisle & Hammond Co.—"Improved Product Design with Machine Alloy Steel Screws" is a pocket-sized illustrated booklet of 16 pages relating how these fasteners offer strength, economy, safety and appearance. A number of design considerations for various types are presented.

11-30-53

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79. Press Hitch Feed

H. E. Dickerman Mfg. Co.—Brief description, a list of features and specifications on the 2½-in. model K hitch feed are provided in data sheet. Feed, for attachment to any mechanical or hydraulic press, can be mounted on die set or bolster plate. Ten other bulletins on die feeds, hitch feeds and other products will be sent to those requesting this bulletin.

80. Metal Composition Chart

Sam Tour & Co.—Wall chart together with explanatory folder shows compositions of all commonly used industrial metals and alloys. Such factors as constituent elements, percentage composition ranges, atomic number and specific gravity are shown for more than 60 different classes of metals.

81. Motor Control Systems

Clark Controller Co.—"Control Centers by Clark" is title of well-illustrated 28-page bulletin explaining centralized electrical motor control systems. Systems, which can be tailored to suit a machine, group of machines, complete process or a complete plant are fully explained and various standardized components used are shown.

82. Metal Stampings

Kickhaefer Mfg. Co.—64-page catalog No. 853, a book of engineering drawings and specifications for metal stampings, covers variety of tubing and wiring clamps, pipe clamps, expansion plugs, core hole plugs, retainers, special lock-washers, horseshoe washers, valve spring washers and others. Items are available without tool charges and are made according to specifications.

83. Hydraulic Cylinders

S-P Mfg. Corp.—Line of space-saving high pressure hydraulic cylinders is described in illustrated catalog 103 of 10 pages. Made in compliance with JIC standards, cylinders are for working pressures up to 2000 psi. Eleven models have bore sizes from 1½ to 8 in. Engineering data are presented.

84. Bronze Products

Johnson Bronze Co.—The 104 pages of catalog 530 cover bronze bearings, bar bronze, babbitt and powder metallurgy. Progressive size and numerical listings of general purpose bearings, electric motor service bearings by motor manufacturer, listings of bronze bars by size, cast bronze graphited bearings, and self-lubricated bearings are among contents.

85. Bronze Welding Alloys

Titan Metal Mfg. Co.—"Bronze Welding Rods" are described in 6-page illustrated folder of this title. Chemical and physical properties and revised standards which rods meet are shown, as well as recommended uses and specific applications. Eight types in three major grades are available.

86. Silicone Products

Garlock Packing Co.—Silicone products covered in 8-page illustrated bulletin include diaphragms, gasketing, sheet packing, oil seals, rings, insulation tape, rod and valve stem packings and molded shapes. Their features and forms are discussed.

EDITORIAL ARTICLES

Available in Limited Quantities

87. Super-Thin Strip

In STEEL article on "Super-Thin Strip" it is pointed out that rolling it is only half the job. Operation of a modern mill involves electric drives, air conditioning, hydraulics, electronic gaging and precision grinding. How Wallingford Steel Co. is able to turn out precision strip down to 0.002-in. thickness in widths to 24 in. is related.

88. Birthmarking of Steels

The code for identifying steel published by the Canadian Government Specifications Board is described in STEEL article "Canadian Plan for Birthmarking Steels." Method set forth for cold finished shapes is ink stamping, for hot-rolled, indentation stamping. Both are supplemented by standard color code prepared for 24 sub-groups.

89. Metal Cleaning Cycles

In this second half of Dr. Samuel Spring's STEEL article "Selection of Metal Cleaning Cycles" the importance of water is pointed out in terms of hardness and rinsability. It is but one of many variables that must be weighed in the choice of the right cleaner for the job.

90. Designing for Quality

A. O. Smith Corp. has devised extraordinary housekeeping methods in its new electrode plant to maintain near-perfect quality in its manufacturing process. These methods, plus built-in maintenance are spelling out quality control. The story is in STEEL article "Design for Better Quality."

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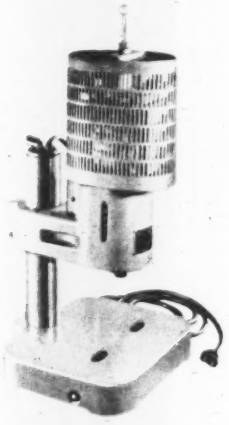
produce more working surface, and a skirt is added to protect recessed hand switch from breakage or accidental operation. Adjustable bracket is redesigned and strengthened to give the solenoid better support and alignment.



Series 4 is operable by hand, foot or automatic switch. It is a bench model unit that weighs only 50 pounds and it can be plugged into any electrical outlet. Black & Webster Inc., Dept. N 87, 445 Watertown St., Newton 58, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Mechanical Comparator

. . . checks parts on line

This vertical, mechanical comparator is used for checking parts dimensions on assembly line, in tool room or inspection department. Because it is completely mechanical, it sets up anywhere in a plant without making or breaking electrical connections. It has magnifications of x500, x1000, x1500, x3000 and capacities of 6 and 12 inches in each magnification.

Uniform measuring pressure on the measuring spindle makes ac-

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on the Sperry ultrasonic testing REFLECTOSCOPE

IN EIGHT COMPREHENSIVE PAGES our new Bulletin 50-105 tells you just *how*, *where* and *why* this latest development in nondestructive testing instruments can cut your production and maintenance costs.

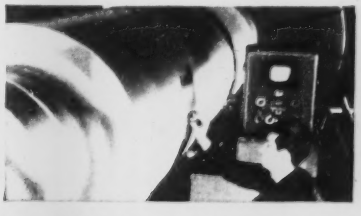
THE ULTRASONIC REFLECTOSCOPE is the unique, portable instrument that enables you to "see" inside a variety of metals and other materials. By means of a distinct pattern on a cathode ray tube, it enables you to locate and evaluate—*quickly* and *economically*—both surface and internal defects.

WHATEVER THE SIZE OF YOUR PLANT, applications are unlimited. You can *cut wasted machine- and man-hours* through fast, accurate quality-control of raw materials and machined parts. You can eliminate serious production delays through discovering fatigue cracks in your heavy equipment *before they lead to breakdown.*

OPERATION is simple—all electronic circuits are practically automatic. Penetration is deep—30 feet, for example, in solid steel.

THE REST OF THE STORY is contained in our new bulletin. To get your copy immediately, fill out and mail the attached coupon today.

The unique, economical Reflectoscope is now cutting production and maintenance costs in plants of all types and sizes all over the world.



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Danbury, Connecticut

☐ Please send me a copy of your new Bulletin 50-105.

☐ Have your representative call.

Material to be tested
Name
Title
Company
Address
City Zone State

(Advertisement)

An idea of the variety of problems beryllium copper has been called on to solve can be seen in any sporting goods store. Here are a few applications: (1) Scott-Atwater outboard motor; (2) Aqua Sportsman reel; (3) Argus C3 flash camera; (4) Champion telescopic casting rod; (5) marine tools. For further details, see below.

FOR FISSION OR FISHING

Beryllium copper solves a variety of design and production problems

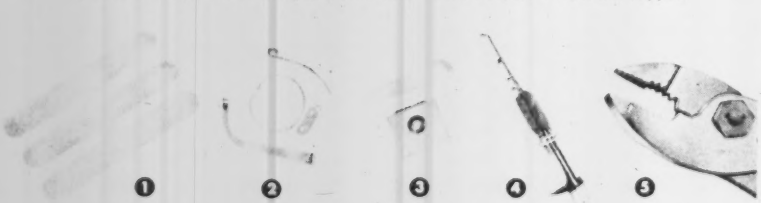
You rarely see the remarkable qualities of beryllium copper alloys at work — you see just the end product in which they serve. Designers of sporting goods, however, have brought beryllium into the open.

Any sportsman who has handled a beryllium copper fishing rod knows what excellent spring properties this alloy has as well as resistance to corrosion. He can see for himself how well the control arm of his non-backlash reel resists wear. Nor does he have to be a student of fatigue endurance to appreciate the trouble-free performance his outboard gives him.

The role of beryllium copper in atomic development in radar and electronic equipment — in aviation instruments, etc., is familiar. Features which make it desirable for these uses are just as important in the manufacture of cameras, sporting rifles, rods and reels, and all the other things which heighten our enjoyment of leisure.

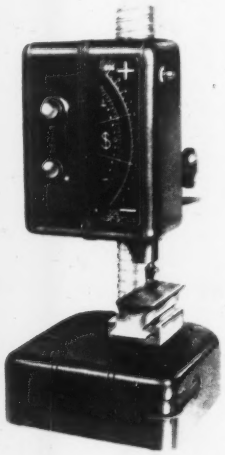
Whatever you manufacture, it is more than likely that beryllium can improve your product or assist in its production. If you would like to take advantage of this unique material, you are invited to share the experience and know-how of the world's leading producer of beryllium. Write THE BERYLLIUM CORPORATION, Dept. 3K, Reading 19, Pa.

Tomorrow's products are planned today — with Beryleo beryllium copper



(1) Beryleo flapper valve in the Scott-Atwater outboard opens and closes 4200 times a minute. (2) Beryleo control arm, brake shoe spring and clicker spring used in the Aqua Sportsman reel. (3) The Argus flash camera employs a Beryleo locking device as well as a Beryleo shorting strip. (4) Three Beryleo forms make up the Champion casting rod: Beryleo strip, rod and tubing. (5) Noncorrosive marine tools also make excellent nonsparking safety tools.

curate readings possible over the entire range. Adjustable limit indicators can be locked in position



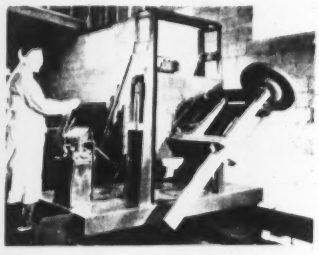
if desired. Cosa Corp., Dept. ST, 405 Lexington Ave., New York 17, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Hydraulic Manipulator

. . . moves hot, awkward forgings

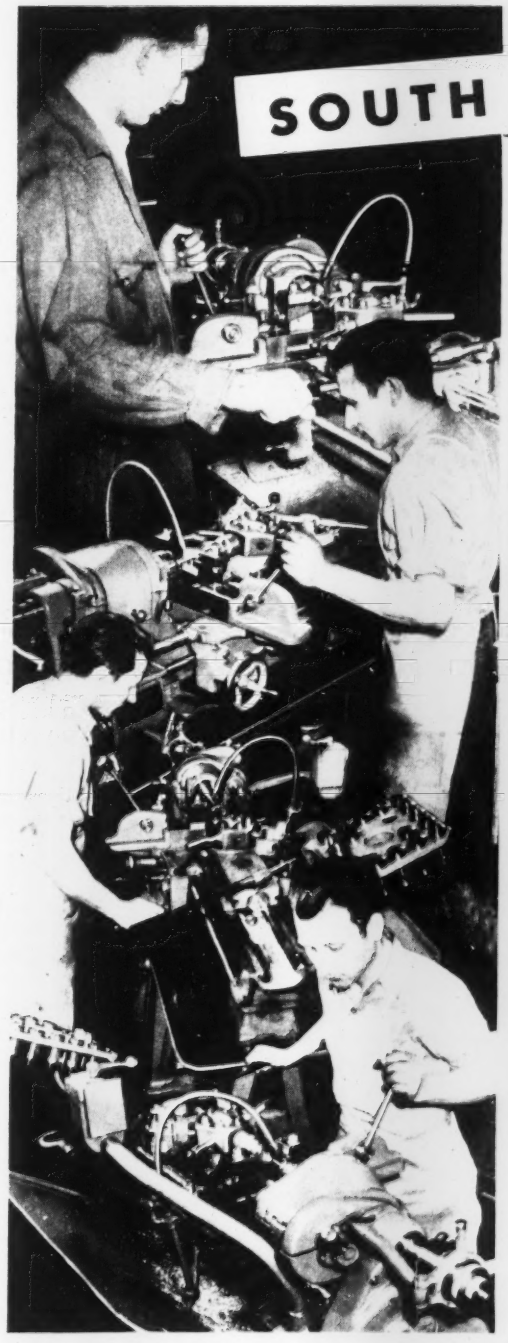
Reduced hazards and increased speed in removing large forgings from hardening furnaces and lowering them into quench tank are achieved by this electric-hydraulic manipulator. In the application for which the unit was designed, a 1000-pound forging was removed from a furnace at 1600 F, rotated



90 degrees, then lowered into the quench tank. Entire cycle is completed in 10 to 15 seconds.

Machine rides a pair of rails from the discharge end of the furnace to a point over the quench tank. The operator is on a safely-located platform that allows him to observe every operation. Grand Specialties Co., Dept. ST, 3101 W. Grand Ave., Chicago, Ill.

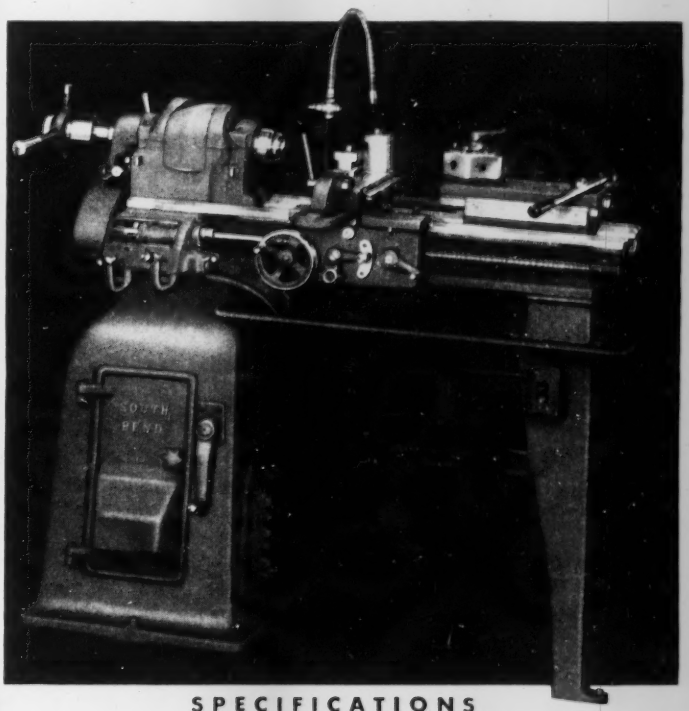
FOR MORE DATA—CIRCLE REPLY CARD NO. 14



SOUTH BEND 1000 TURRET LATHE

Cost-Cutting Versatility

This precision turret lathe will cut your machining costs on small parts. Built-in accuracy, ease of operation and a wide range of speeds and feeds insure high production and close tolerances. Practical attachments simplify tooling the lathe for jobs which might otherwise require special fixtures. What's more, your least experienced operator will soon be a top producer on the 1000 Turret Lathe — it's that easy to run. Find out how this versatile turret lathe can improve your machining — *send coupon now.*

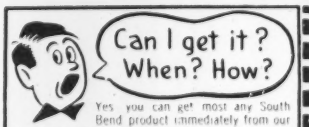


SPECIFICATIONS

Swing	10-1 8"
Turret to Spindle	19-3 8"
Collet Capacity	1"
Spindle Bore	1-3 8"
Spindle Speeds	12
	50 to 1357 r.p.m.
Power Longitudinal Feeds	70
	.0007" to .0836"
Power Cross Feeds	70
	.0003" to .0303"
Thread Cutting Feeds	70
	4 to 480 per inch

$1574.00 f.o.b. factory

CL1006Z illustrated, less motor, controls, draw-in collet chuck, splash pan, coolant pump. Time terms: 10% down, balance 12 or 18 months.



Yes, you can get most any South Bend product immediately from our distributor's stocks in principal cities. Items not stocked, shipped promptly from factory.

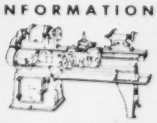
Three ways to order:

1. See or telephone nearest distributor.
2. Order by mail from your distributor.
3. If no distributor is nearby, order direct from factory.

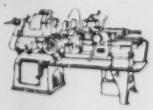
South Bend machine tools with accessories may be purchased on convenient terms up to 12 months.

PLEASE SEND INFORMATION CHECKED:

☐ 9" and 10" BENCH LATHES


☐ 10" to 16-24 FLOOR LATHES

☐ DRILL PRESSES


☐ ½" & 1" Collet TURRET LATHES

☐ TOOL GRINDERS

☐ 7" BENCH SHAPERS

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Street _____ City & State _____

Building Better Tools Since 1906 • **SOUTH BEND LATHE** • South Bend 22, Indiana

Blue Monday!

A washer's a "washout" without fasteners. But luckily for the housewives of America this catastrophe can never happen.

For Lamson & Sessions has long worked hand in glove with the appliance people to develop dependable engineered fasteners for home appliances.

If you, too, want to be *sure* of the "just right" fasteners for your product, check with Lamson during the planning stage. Our engineers will be happy to help you with your selection and possibly suggest fasteners that will save time and money on the assembly operation.

Remember, no matter what your fastener requirements, it's always *pleasant* and *profitable* to do business with Lamson & Sessions.

TAPPING SCREWS For Fast Sheet-Metal Fastening

Self-tapping screws require no nuts, no tapped holes. Therefore, they are important time-savers on all sheet metal assembly work. A choice of type "A", "B" and "C" threads. Heads available with slotted or Phillips driver recesses.

Lamson + Sessions

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MACHINE SCREWS AND NUTS
Precision made for fast, economical assembly.

PLUG NUTS
Ideal for blind or hard-to-reach places.

TAPPING SCREWS
Choice of round, pan, truss, flat oval, hexagon and Phillips heads.

CAP SCREWS
Bright and "1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX NUTS
Semi-finished, hot pressed, cold forged.

LOCK NUTS
Economical, vibration-proof. Can be used repeatedly.

COTTER PINS
Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS
Cup point type, hardened and heat-treated.

CALENDAR
OF MEETINGS

November 30-December 1, American Management Association: Special supervisory conference. Palmer House, Chicago. Association address: 330 W. 42nd St., New York 36. President: Lawrence A. Appley.

November 30-December 3, American Institute of Steel Construction Inc.: Annual convention. Boca Raton hotel and club, Boca Raton, Fla. Institute address: 101 Park Ave., New York 17. Secretary: M. Harvey Smedley.

November 30-Dec. 5, Exposition of Chemical Industries: Commercial Museum and Convention Hall, Philadelphia. Information: Charles F. Roth, 24th Exposition of Chemical Industries, 480 Lexington Ave., New York.

December 1, Spring Manufacturers Association: Annual meeting, Biltmore hotel, New York. Association address: 249 Main St., Bristol, Conn. Secretary: George E. Underwood.

December 2-4, American Institute of Mining & Metallurgical Engineers: Annual electric furnace steel conference. Netherland Plaza hotel, Cincinnati. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

December 2-4, Society for Experimental Stress Analysis: Annual meeting, Hotel McAlpin, New York. Society address: P.O. Box 168, Cambridge 39, Mass. Secretary: W. M. Murray.

December 2-4, Mid-Century Conference on Resources for the Future: Washington. Information: Norvell W. Page, conference director, Resources For The Future Inc., 501 Stoneleigh Court, 1025 Connecticut Ave. NW, Washington.

December 3, American Iron & Steel Institute: Philadelphia regional technical meeting, Warwick hotel, Philadelphia. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

December 3-4, Society of the Plastics Industry Inc.: Film, sheeting and coated fabrics division conference, Hotel Commodore, New York. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

December 5, American Electroplaters' Society: Research committee conference, Statler hotel, Detroit. Society address: 445 Broad St., Newark 2, N. J. Executive secretary: P. Peter Kovatis.

December 7-10, Scientific Apparatus Makers Association: Midyear meeting, laboratory apparatus, equipment and optical sections, Boca Raton club, Boca Raton, Fla. Association address: 20 N. Wacker Dr., Chicago 6. Executive vice president: Kenneth Andersen.

December 8-10, American Institute of Electrical Engineers: AIEE-ACM-IRE Eastern computer conference, Statler hotel, Washington. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

December 9, Steel Kitchen Cabinet Manufacturers Association: Winter meeting, Edgewater Beach hotel, Chicago. Association address: 1008 Engineers Bldg., Cleveland. Executive secretary: Arthur J. Tuscany Jr.

December 13-16, American Institute of Chemical Engineers: Annual meeting, Hotel Jefferson, St. Louis. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

December 16-18, Material Handling Institute: Annual meeting, Hotel Statler, New York. Institute address: 813 Clark Bldg., Pittsburgh 22. Managing director: R. K. Hanson.

December 29, American Association for the Advancement of Science: Panel discussion on visual performance and testing procedures, Bradford hotel, Boston. Panel chairman: Dr. N. Franklin Stump, Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

January 5-7, American Road Builders' Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: World Center Bldg., Washington 6. Secretary: Lt. Gen. Eugene Reybold.

January 11-13, Truck-Trailer Manufacturers Association Inc.: Annual meeting, Boca Raton hotel and club, Boca Raton, Fla. Association address: 1024 National Press Bldg., Washington 4. Managing director: John B. Hulse.

January 11-15, Society of Automotive Engineers Inc.: Annual meeting and engineering display, Hotels Sheraton-Cadillac and Statler, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 12-14, National Constructors Association: Annual meeting, Hotel Commodore, New York. Association address: 50 E. 41st St., New York. Secretary: C. B. Bronson.

January 13, American Boiler Manufacturers Association & Affiliated Industries: Winter meeting, Hotel Cleveland, Cleveland. Association address: 1571 W. 117th St., Cleveland 7. Secretary: A. C. Baker.

January 17-19, Institute of Scrap Iron & Steel Inc.: Annual convention and exhibit, Hotel Statler, Washington. Institute address: 1729 H St. NW, Washington 6. Executive vice president: Edwin C. Barringer.

January 18-22, American Institute of Electrical Engineers: Winter general meeting, Statler hotel, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 19-21, Caster & Floor Truck Manufacturers Association: Winter meeting, Hotel New Weston, New York. Association address: 27 E. Monroe, Chicago 3. Executive secretary: H. P. Dolan.

January 21-22, National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

January 22, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society address: 1501 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

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Specialization gives you "Tops in Quality"

ALLOY STEEL TUBES

SEAMLESS—MECHANICAL—PRESSURE—CORROSION-RESISTANT

TYPICAL ANALYSES:

Carbon	5 Chrome ½ Moly
Carbon ½ Moly	7 Chrome ½ Moly
½ Chrome ½ Moly	8 Chrome ½ Moly
1 Chrome ½ Moly	8 Chrome 1 Moly
1¼ Chrome ½ Moly	9 Chrome 1 Moly
2 Chrome ½ Moly	3½ Nickel 2% Nickel
2¼ Chrome 1 Moly	5½ Nickel 9% Nickel

AISI Types: 304-321-347-316-309-310-405-410-430-446-446

Analyses to meet conditions where heat, corrosion, pressure and structural strength are involved.

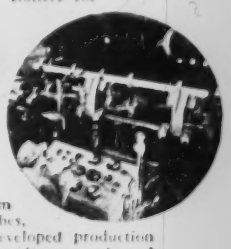
SIZE RANGE—WALL THICKNESS: ½ to 6 inches O.D. — wall thickness .035 to 1.000 inch.

TYPICAL APPLICATIONS:

Pressure tubes — Superheater tubes — Condenser tubes — Still tubes — Evaporator tubes — Barrel tubes — Oil-well Pump Barrels — Mechanical tubes — Aircraft tubes — Propeller tubes — Rollers for Transmission Chains.

Globe engineers gladly give you the benefit of specialized knowledge of stainless steel tubing in a wide range of services and applications — to improve your product — to cut costs.

The heating, piercing, rolling of seamless tubes is controlled at every step for uniformity, close tolerance.



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WHEN you specify Globe, you get uniform high quality alloy steel tubes, the product of highly developed production facilities and specialized quality controls and methods. All Globe tubes are thoroughly inspected and closely held within tolerance specifications. Write for the Globe general catalog.

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Producers of Globe seamless stainless steel tubes — Globelt stainless steel tubes — alloy — carbon —seamless steel tubes — Globetron (high purity ingot iron) seamless tubes — Globe Welding Fittings.

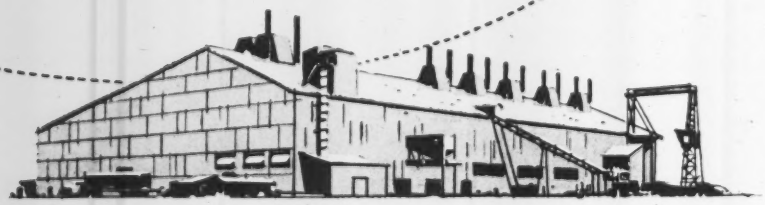
Here's what you've been waiting for...

EXLO

~new low-carbon ferrochromium....

EXLO

is produced in a completely new plant which Vanadium Corporation has recently added to its existing facilities at Graham, West Virginia.



...exceptionally clean, dense, low in carbon

EXLO, a unique, new extra low-carbon ferrochromium containing .025% carbon maximum, is distinguished by the following properties:

HIGH DENSITY—apparent density is very close to true density; less storage space is required per unit of chromium.

EXCEPTIONAL CLEANLINESS—eliminates many undesirable nonmetallics which might otherwise be added to the metal.

HIGH CHROMIUM-CARBON RATIO—results in less objectionable carbon being added per unit of chromium.

HIGH CHROMIUM CONTENT—reduces the total ferro alloy needed in late furnace additions to meet the chromium specifications of the steel.

LOW SILICON CONTENT—to meet the specific needs of the individual steelmaker.

. . . *and* **EXLO** can be furnished in a wide range of sizes.

These unique advantages point to scores of important applications. With EXLO, the steelmaker can now produce top-quality stainless steels of extremely low carbon content without resorting to costly, time-consuming modifications of furnace and melting practice.

EXLO is a product completely new to the iron and steel industry of America. It is the result of a unique, exclusive process . . . a process adopted as part of Vanadium Corporation's long-range program designed to meet the growing demand for more and better alloys throughout the metals industries.

* * * * * *

Your nearest Vanadium Corporation representative will be glad to give you further information on EXLO and its applications. Call or write him today.

EXLO is also available in .06% carbon maximum grade. For some steel specifications, use of this alloy eliminates the need of blending chromium products of higher and lower carbon content.

VANADIUM CORPORATION OF AMERICA

Producers of alloys VANCORAM metals and chemicals

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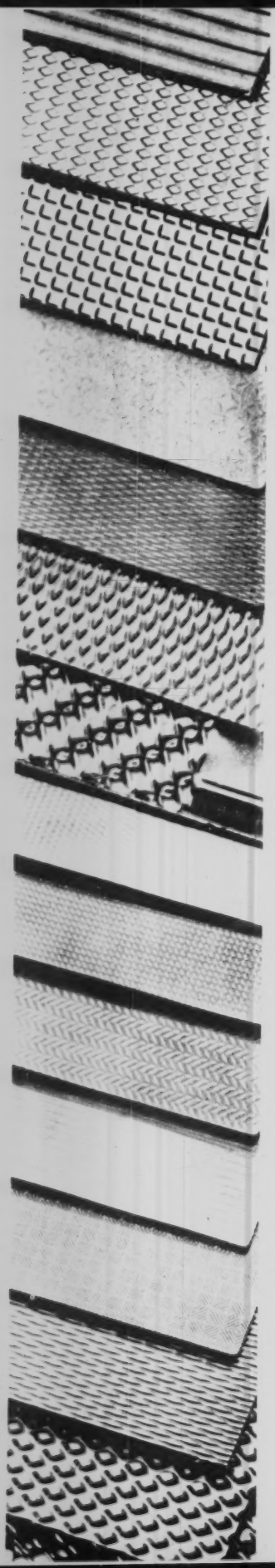


New Kink In Product Design

Unique product and architectural properties are imparted to number of flat ferrous and nonferrous metals by putting them through special third dimensional rolling operation

LONG before 3D started to repopulate empty seats in movie houses, a firm in Buffalo, N. Y., was adding a dimension to flat metal by passing it through patterned male and female rollers.

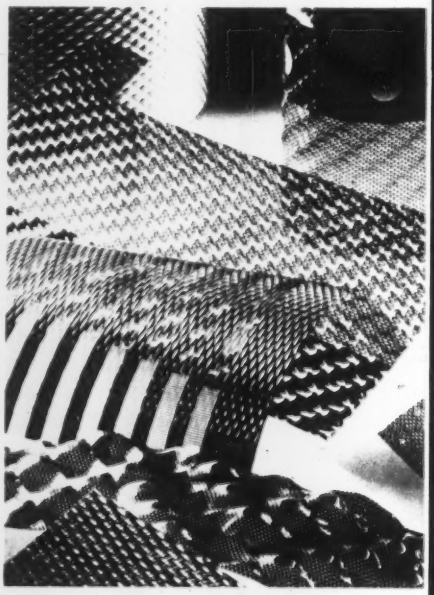
It has been more than a decade, in fact, since Rigidized Metals Corp. announced the birth of its 3D product, and, even though it can't be described as something new today, it is still growing applicationwise.

Here's How—Rolling redistributes metal away from the neutral plane of a sheet, creating a three-dimensional pattern with a clear-through design.

By this relatively simple operation unique application properties are imparted to ferrous or nonferrous metal in sheet, strip, coil, cut length, solid or perforated form.

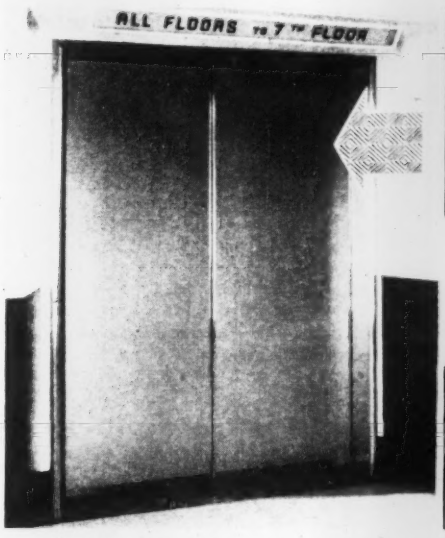
Take strength, for example. Compared with ordinary metal of identical gage, Rigid-Tex metal can provide as much as 108 per cent greater rigidity, 70 per cent greater buckling strength, 39 per cent greater impact resistance and 92 per cent greater tensile strength.

Attractive, Too—This treatment gives metal greater strength in all directions in contrast with corrugation, which ups strength in only one direction. Resulting dividend is that lighter gages can be substituted, reducing weight and saving metal without sacrificing strength. For example, thickness can be reduced two full gages or more. Gage of 0.037-inch is ordinarily used for seat backs on buses. Using the 3D metal, gage 0.018-inch will do the same job at a metal saving of 51 per cent.

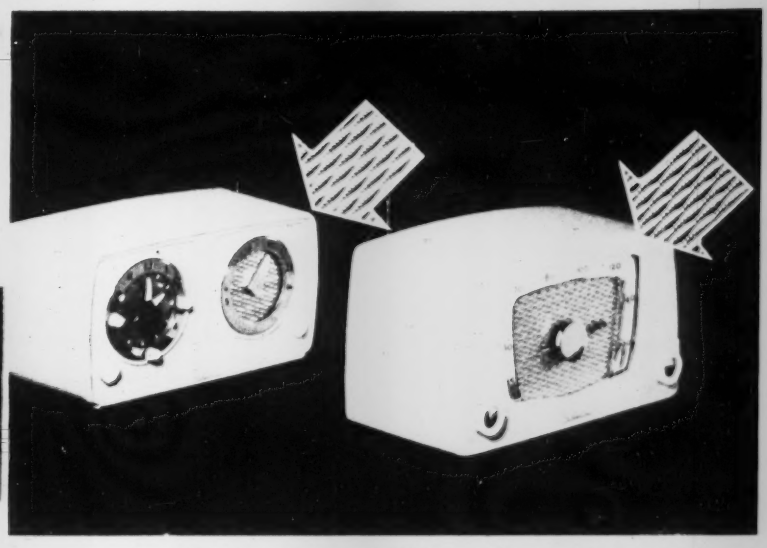


Texture of the many patterns is highly decorative, offering wide possibilities for decorative effects. It can be finished in the natural color of the metal or oxidized and highlighted, giving the effect of two tones. Dyed or anodized metal and enamels may be used in solid or varied tones.

Finish tends to conceal scratches, smudges and fingerprints. Cleaning and maintenance costs are reduced. Agents used to clean ordinary sheet are effective for most patterns. With deeper patterns, best results are obtained when cleaner is applied with a brush, stroking parallel to pattern direc-



Stainless Rigidized metal. Treatment protects against fingerprints, scratches, dents; is easy to maintain



Perforated brass used for grille is decorative, doesn't sag and is punctureproof. Sound transmission is good

tion. Cleaners such as Bon Ami should be allowed to dry to a white powder before removing.

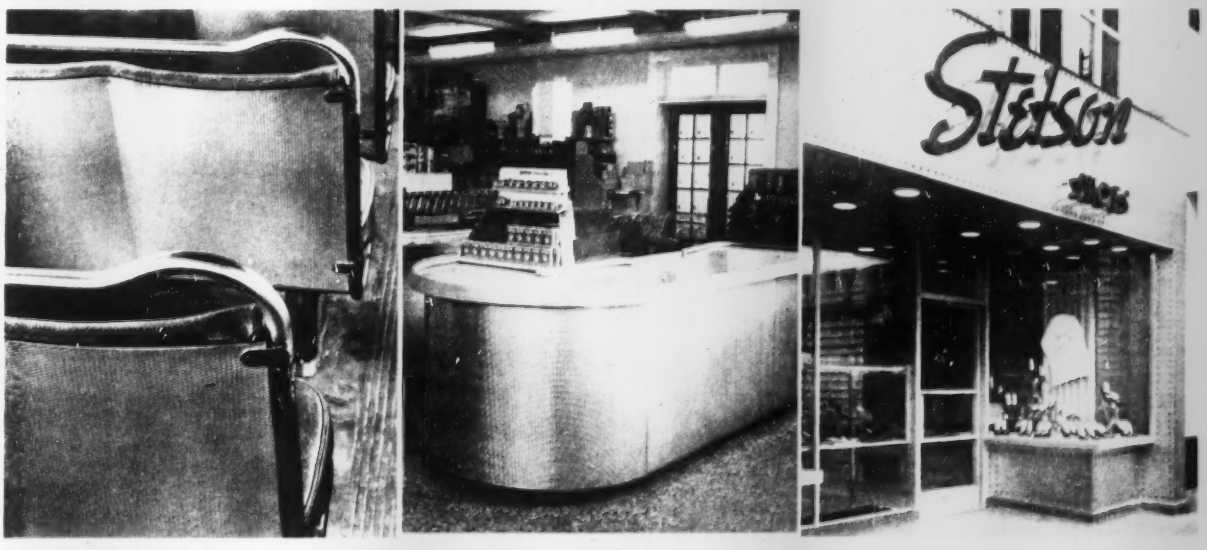
Versatility—Metal offers a number of functional advantages that lend themselves to product and architectural design.

Non-skid properties: Typical applications include floor, stair treads, airport ramps and sewing machine face plates. Metal is also used for flooring in trucks, trailers and other vehicles. Here walking surfaces are non-skid, but raised pattern makes it easier to move cargo across the surface.

Heat-transfer properties: Raised design provides greater surface area for heat radiation, substantially reducing spot heat concentration. Where a high degree of thermal insulation is necessary, special patterns are combined with flat sheets in composite duplex or triplex panels with insulating air pockets. When joined with an insulation material for exterior walls, these panels provide a surface which is rigid and distortion-free.

Acoustical properties: Perforated 3D metal can be used to deaden or dampen sound. It is often backed by felt for use in libraries, telephone booths and similar installations to trap noise. Opening can cover as little as 20 per cent of metal area with good acoustical results. Phone booths lined with product reduces outside sound volume by 40 decibels in areas averaging 50 decibels.

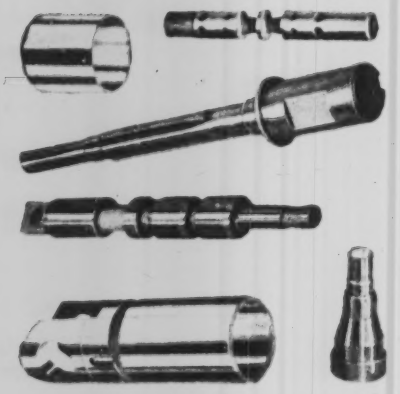
Workability—Product can be bent,



Other uses of 3D metal: Bus seat backs, grocery counters and storefronts

OTTAWA OSP INC. STEEL PRODUCTS

HARDENED AND GROUND SCREW MACHINE PRODUCTS



EVERY ITEM PRODUCED PRECISELY

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- ROTOR SHAFTS
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- OUTER RACES
- VALVE TAPPET ROLLERS

OTTAWA
STEEL PRODUCTS, INC.
GRAND HAVEN, MICHIGAN

3D METALS OFFER VERSATILITY

Production / Applications	1 — Decorative Texture	2 — Mar Concealment	3 — Anti-Vandalism	4 — Anti-Mirroring	5 — Anti-Glare	6 — Heat Diffusion	7 — Flatness, Rigidity	8 — Structural Strength	9 — Sound Transmission	10 — Sound Deadening	11 — Anti-Skid	12 — Weight-Saving	13 — Increased Reflectivity	14 — Impact Resistance
Aircraft Flooring							X	X			X	X		X
Airplane Galley Equipment	X	X		X	X		X						X	X
Amusement Ride Trim	X			X	X								X	
Architectural Spandrel Panels	X				X			X				X		
Automatic Phonograph Trim	X		X				X		X				X	
Automotive Interior Trim	X	X										X		X
Automotive Floor Mat Retainers							X			X		X		X
Auto Sun Visors	X	X		X	X		X							
Bar Equipment	X	X	X	X	X		X							X
Builders' Moldings	X	X	X				X							
Bus Baggage Compartment							X	X				X		X
Bus Window Shades	X						X			X				
Bus Window Trim	X		X				X							X
Check-Out Counters	X	X						X				X		X
Coffee Urns	X													
Counter Fronts	X	X	X	X	X		X					X		X
Deep Freeze Liners		X		X	X		X							X
Diner Panels	X	X	X	X	X		X					X		X
Display Background	X			X	X			X						
Electronic Chassis							X	X				X		X
Electronic Equipment Cases								X				X		X
Elevator Car Panels	X	X	X				X	X				X		X
Fan Blades	X						X					X		
Field X-Ray Equipment Containers							X	X				X		X
Fishing Spoons				X	X									
Fruit Juice Dispensers	X	X		X	X									
Furniture	X	X					X	X						X
Helicopter Flooring, Catwalk							X				X	X		X
Ice Cream Cabinet Tops	X	X	X	X	X		X							X
Instrument Cabinets	X						X	X				X		X
Jet Engine Exhaust Blankets						X	X			X				
Kitchen Sink Tops	X	X		X	X		X							X
Mail Truck Interior Panels							X	X		X		X		X
Processing Filters							X	X						
Radar Vanes					X			X				X		
Radiant Heating Panels							X						X	
Radio Control Panels	X						X	X						X
Radio Grilles	X		X				X		X					X
Railroad Car Interiors	X	X	X	X	X		X					X		X
Railroad LCL Freight Containers							X	X				X		
Refrigerator Trim	X	X		X	X									X
Screen Door Kick Plates	X	X			X			X						X
Scuff Plates	X	X	X		X		X							X
Shelf and Panel Frieze	X						X							
Signs	X	X	X	X	X								X	
Soda Fountains	X	X	X	X	X									X
Space Heater Doors	X	X		X	X	X	X						X	
Stair Step Treads		X					X				X	X		X
Stove Decks						X	X	X				X		
Stove Trims	X	X		X	X									
Switch Plates	X	X		X	X									X
Telephone Booths	X		X				X			X				X
Transportation Seat Backs	X	X	X					X				X		X
Truck Linings	X						X	X				X		X
Truck Panels, Roof Decking							X	X			X	X		X
Vacuum Cleaner Tubes	X	X					X							
Vehicle Flooring							X				X	X		X
Vending Machines	X	X	X	X	X		X					X	X	X
Wall Tiles	X	X	X	X	X									X

Continued on p. 144

BETTS • BETTS-BRIDGEFORD • COLBURN • HILLES & JONES • MODERN • NEWTON • SELLERS

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MACHINE TOOL CORPORATION

WHOLLY OWNED SUBSIDIARY OF FARREL-BIRMINGHAM COMPANY, INCORPORATED

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When you see this new *"Code of Ethics"* Seal displayed on industrial gas equipment, it's your assurance that sound engineering and proved research underlie design and construction of each component part. This is part of the Code through which manufacturers pledge that highest standards of safety, performance and durability are being met. Watch for this *Seal* . . . symbol of integrity and quality . . . when you buy industrial gas equipment.

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Continued from p. 142

welded, soldered, riveted, formed, stamped, drawn and lock-seamed. It is just as workable as ordinary metal. Good example is a television chassis that is blanked, stamped, punched, formed and welded with same tools used for fabrication of flat metal chassis.

For best results, manufacturer has set forth several general rules for user to follow.

Welding—For resistance welding, place copper wire braid between electrode and metal to form a nest for pattern and electrode. Metal can be flattened if pattern distortion at the weld is not objectionable. Same applies to seam welding.

Atomic hydrogen butt welding: Good results with patterns having depths up to 0.015-inch. With deeper patterns, it is recommended that sheared edges should be flatter than rolled edges.

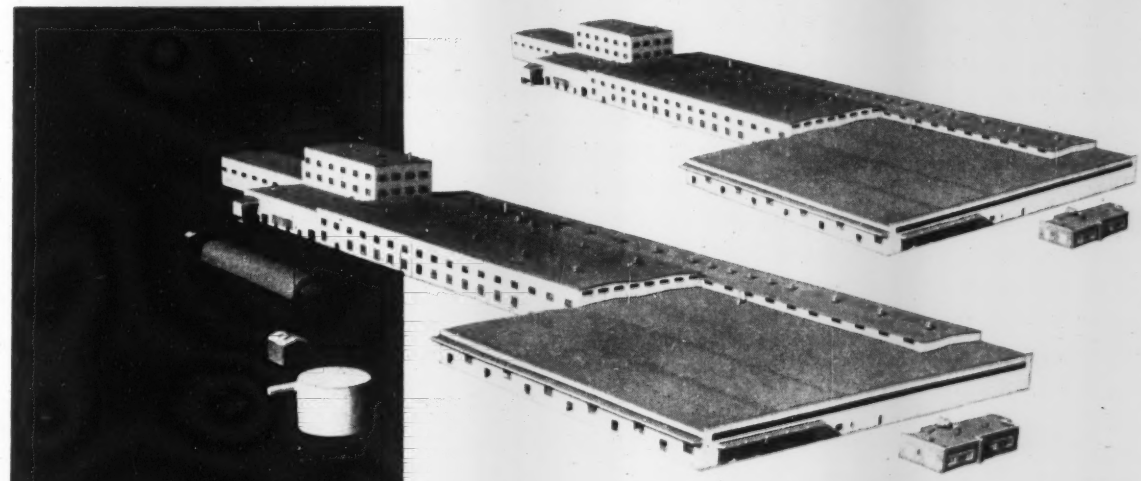
Fusion welding: Method same as with plain sheet or strip including such processes as arc and oxyacetylene. For best appearance, match pattern along edges of joint.

Other Joining Methods—Again, match pattern along edges of joint. Can use soft solder of lead-tin variety and hard or silver solder. Riveting and lock-seaming operations are the same as with plain sheet or strip.

Press Operations—In stamping, it is suggested that a punch and stripper assembly should be used to minimize die breakage in piercing.

Forming: Adjust die clearance for the cross-sectional thickness rather than for metal thickness. Bend radii should be at least twice the cross-sectional thickness of the metal, but sharper bends can be obtained with deeper patterns if the bend lines fall along the apexes of the design. When making severe bends, place axis of bend at right angles to the pattern direction.

Drawing: It is claimed there is no pattern distortion up to a 1-inch depth. Greater depths are possible if moderate pattern distortion is not objectionable. Hydraulic presses are recommended rather than toggle presses. Stress-relieving anneals are suggested for difficult drawn shapes.



TWINS!

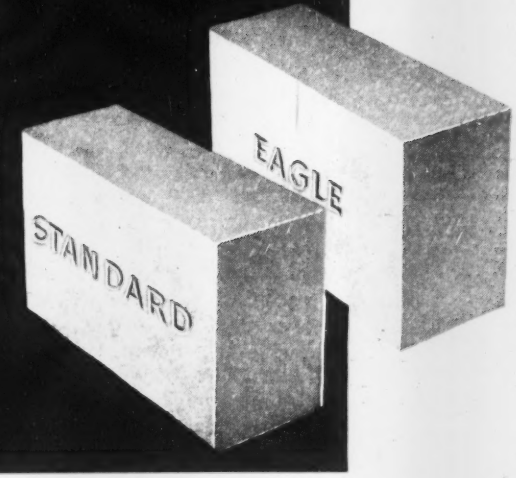
TWO BIG NEW GREFCO PLANTS TO MEET THE NATION'S NEEDS FOR QUALITY SILICA BRICK . . .

Grefco is proud to offer industry its tremendously increased silica brick production facilities, thanks to the inauguration of identical plants in Morrisville, Pa. and Warren, Ohio.

These twin plants will produce twin products—STANDARD and (super duty) EAGLE . . . the finest of silica bricks to provide maximum refractoriness at high temperatures, long life, and low maintenance costs.

Grefco's new expansion program is a major addition to its existing productive facilities for silica brick at its Claysburg, Mt. Union, Childs, Joliet, Rockdale, Lehi and Los Angeles plants.

Wherever you are—if it's silica, or *any* other refractory product, count on Grefco. Research and modern manufacturing processes assure you of quality and quantity at your beck and call.



GENERAL REFRACTORIES COMPANY

PHILADELPHIA

New Top Steps Up Output

Blast furnace meetings in Cleveland cover distributors, carbon linings, 100 per cent sinter

BLAST furnace operators are correct in striving for good distribution of stock in charging operations according to results obtained from a newly developed spinning top, which was described at the annual joint meeting of the Eastern States Blast Furnace and Coke Oven Association and the Blast Furnace and Coke Association of the Chicago District, Hotel Statler, Cleveland, Oct. 30.

The new revolving hopper, developed by the Interlake Iron Corp., Chicago, reduces the ratio of the amount of stock which piles on one side of the hopper to the total amount of the skip charge. It operates at a speed of 26 to 28 rpm and spins in a direction opposite to the swirling motion of the raw materials being fed to it. Use of the spinning top has been found to greatly increase the life of furnace linings and the production of iron.

Gary No. 10—J. M. Walsh, division superintendent, blast furnaces, United States Steel Corp., Gary, Ind., in presenting a progress report on the carbon lining in Gary No. 10 blast furnace, mentioned that the carbon lining above the mantle is cooled by water running down the shell. No indication of a wall buildup, nor any appreciable loss in lining thickness is apparent. Operating results indicate that a carbon lining in the hearth and bosh provides increased capacity and smoother operation, but when used above the mantle results are uncertain.

Sinter Burden—Use of 100 per cent sinter as a blast furnace burden has opened up new concepts in ironmaking, according to G. D. Elliot, works manager (iron), Appleby-Frodingham Steel Corp., Scunthorpe, Lincolnshire, England. Details related to this practice include the following:

Little is known about sinter quality except that the material must be free from unsintered product.

Smelting this amount of sinter has an implication on furnace design inasmuch as results indicate that the height of a stack may be shortened 10 to 15 feet.

Revolving top on one stack burdened with 100 per cent sinter was stopped for a week without affecting practice.

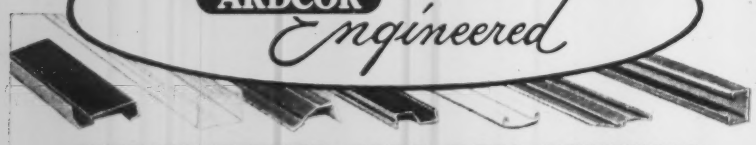
High blast temperature must be carried with an all-sinter burden.

Welded Rail: 112 Miles

Largest single installation of continuous welded rail ever put into service at one location, enough to construct 112 miles of track, will be used in the construction of the Pennsylvania Railroad's new Conway freight classification yard near Pittsburgh.

Approximately 36,000 welds will be required as sections of reconditioned rail, which have been reclaimed from heavy mainline service but still with many useful years of life for yard service, will be welded together end to end to make long stretches of rail for the yard's 150 tracks. The welding operation, carried on at the site, has been underway for some time in order to build an inventory of rail so as to permit steady progress of installation as track construction proceeds.

ARDCOR *Engineered*



MEANS BETTER COLD-ROLL FORMING

The Production-WISE

ROLL FORMING MACHINE

ARDCOR
MODEL 1-F

Spindle Diameter	1½"
Roll Diameter	4¼" to 7"
Horizontal Distance Between Spindles	12"
Roll Space on Standard Machine	10"
Capacity Max.	.072

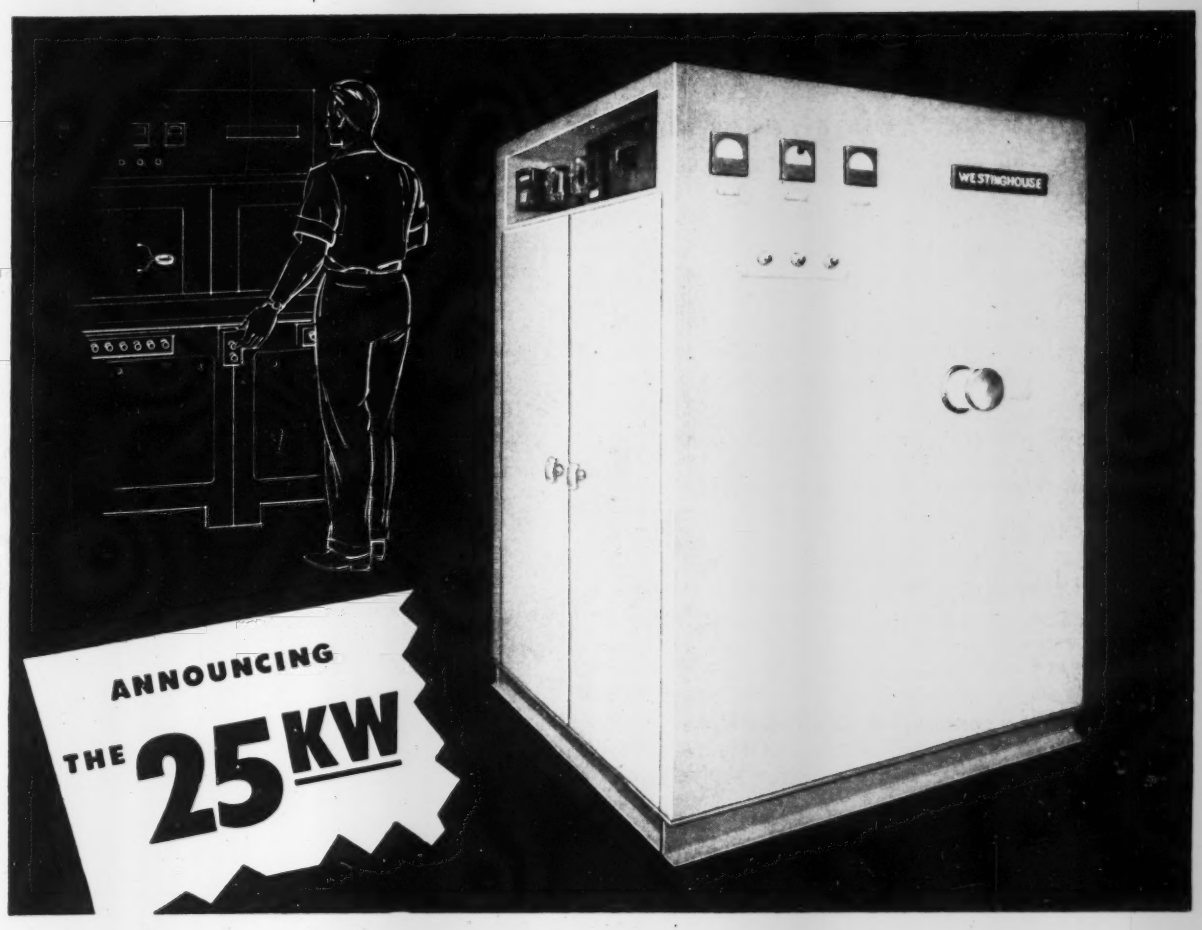
ADAPTABILITY—Ardcor Standard Forming Machines feature "unit construction" for each stand. Thus production changes are easily and quickly made. With this feature, any length base can be furnished to accommodate additional units as required.

Ardcor Roll Forming machines embody the precision, accuracy and stability found only in the highest grade machine tools. In adition, Ardcor offers a completely engineered installation — cradle reels, roll forming machines, roller dies, flying cut-off fixtures, etc. —from one qualified source.

Likely as not your special shapes can be ideally handled by a standard Ardcor machine. Your inquiry is invited—without obligation.

Also Standard Machines up to 4½" Spindle Diameter.

American ROLLER DIE CORPORATION
29520 Clayton • Wickliffe, Ohio



NEW HF INDUCTION HEATING GENERATOR

PUTS FULL POWER INTO A WIDER VARIETY OF LOADS

Westinghouse now presents a new high-frequency generator with 25 KW output at 100% duty cycle. For optimum performance, the new 25 KW has a tank kva of 1620. This means you can now put full power into a wider variety of loads . . . even where close coil coupling is impractical. Non-ferrous materials, like brass, copper and aluminum, can be heated in much shorter time. You benefit in higher production rates at lower costs.

This latest addition to the Westinghouse line of induction heating tools has many more outstanding benefits. Here are some of them:

- Allows positive, precise heat control of short production runs on a variety of jobs . . . or long production runs with rapid heat cycles. The built-in electronic keying of power output that makes this possible also eliminates main contactor arcing.
- Provides smooth variation of power output from 25% to 100%. This simplified power output system utilizes dependable, maintenance-free saturable reactors and longer-life, cost-cutting diode rectifier tubes.
- Gives complete protection against condensation and water impurity troubles. The built-in distilled water cooling system and heat exchanger offers substantial raw water economy, too.
- Assures long tube life, peak performance and minimum maintenance by close regulation of filament voltages.
- Offers easy inspection and maintenance through the full-opening double doors, easier operation through a simplified combination of conveniently located controls.

The new Westinghouse 25 KW RF Generator is available now in this de luxe model. A standard model is also available with electronic keying and smooth power output control features as easily-installed optional accessories. Both models offer flexible, economical handling of hardening, annealing and metals-joining jobs. For full information write: Westinghouse Electric Corporation, Electronics Division, Induction Heating Section, 2519 Wilkens Avenue, Baltimore 3, Maryland.

YOU CAN BE SURE... IF IT'S Westinghouse

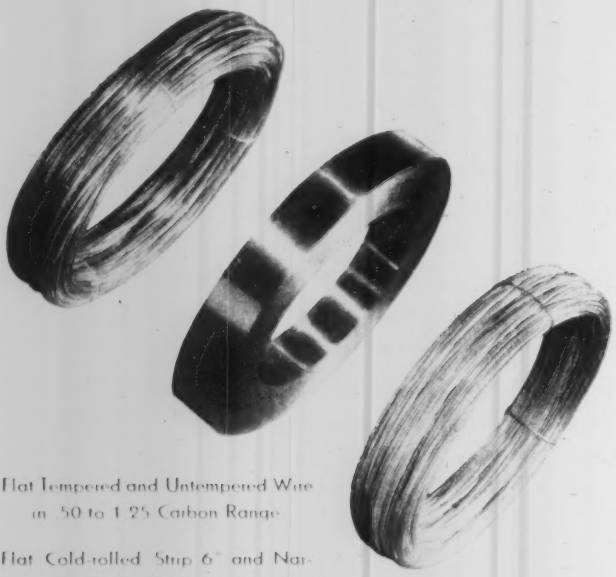
J-02270

Some like their sleeves shorter . . . .

Starting with small heats at the Washburn Steel Mill, Washburn Wire is tailored to exact specifications.

Uniform Quality is never sacrificed to expediency—Washburn Craftsmen must make their product fit the demands of your product.

For over half a century, manufacturers have depended on WASHBURN.



Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range

Flat Cold-rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Market Outlook

A NEW METHOD of pricing steel will go into effect Dec. 15. It will be introduced by Republic Steel Corp. and will apply to hot-rolled carbon bars.

SPEEDY— The new method (see p. 55) enables a steel buyer to determine in a moment what the delivered base price of hot-rolled carbon bars will be to his plant. For the last five years the customary practice of steel producers has been to quote prices at the mill, with delivered prices quoted when requested.

The job of computing freight costs has been a burdensome one, whether it was by the steel producer or the steel consumer. Of course, during the steel shortage the primary concern of steel buyers was to get the steel, with freight costs being secondary.

NEEDED— Now that steel is increasingly plentiful, buyers are taking a keen interest in getting it at the lowest possible cost. With increasing frequency, steel salesmen are being asked to quote delivered prices. Because of the thousands of combinations of products and transportation rates involved, the problem of determining delivered prices becomes complex.

SIMPLE— To short-cut the problem, Republic Steel has computed a delivered base price on hot-rolled carbon steel bars to every county that might logically be served from its five mills that produce bars. The prices are published in a simple table which is being supplied to Republic's hot-rolled carbon bar customers.

With prices set up on a county basis, they increase as the distance from a producing point increases. The new pricing method is simplified to the extent that only 40 delivered prices cover all of the areas which the company could serve. Freight used in computing the delivered prices is the lowest transportation cost for delivering hot-rolled carbon bars to a given county. If the consumer wants to use alternate means he will pay the additional cost.

SHORTENED— In simplifying pricing, Republic is rounding its delivered base prices on hot-rolled carbon bars to two decimal places. Until now it has not been uncommon to carry prices to three and four decimal places.

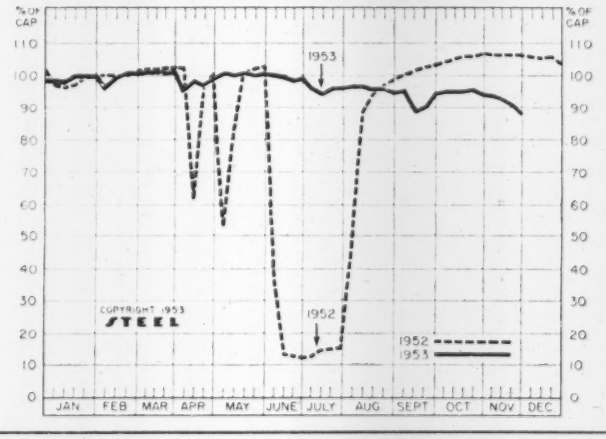
Under the new pricing method, Republic's mill prices for hot-rolled carbon bars at its five mills producing that product will be slightly higher than they have been, but these increased prices will give delivery to any common carrier destination within the county or counties covered by the railroad switching area immediately adjacent to the mills.

EFFECT— Delivered cost to customers will be substantially the same under the new procedure as under the existing method. In some cases there may be slight reductions and in others slight increases.

If the new method proves satisfactory, it will be extended to other products made by Republic. Undoubtedly, the new method will be watched keenly by other steel producers. The decline in demand for steel is spurring them all to look for business and for means of remaining competitive.

OUTPUT DECLINES—The reduced demand for steel and a strike in the Pittsburgh area are reflected in the steelmaking rate for the week ended Nov. 28. It slipped down three points to 87.5 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Nov. 28	Change	Same Week 1952	Same Week 1951
Pittsburgh	77.5	— 3.5*	103.5	101
Chicago	96	— 2	110.5	104
Mid-Atlantic	90	0	101	101.5
Youngstown	93	— 3	106	106
Wheeling	78	—20	100.5	99.5
Cleveland	99.5	+ 0.5*	112.5	104
Buffalo	100	0	106.5	104
Birmingham	96.5	0	106.5	105
New England	85	0	93	91
Cincinnati	67.5	+ 8	99	102
St. Louis	68	+ 8	84	93.5
Detroit	97.5	0	105	106
Western	93	— 1	106	107
Estimated National Rate	87.5	— 3	106	103.5

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,251,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 47 Technical Outlook—p. 97

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Nov. 24

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.458
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.013	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.850	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.775	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.863
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193	‡Not available.	
Bars, tool steel, H.R. alloy, high speed W 18, Cr 4, V 1 (lb)	1.730	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.183				
		Strip, C.R., carbon	7.250				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Nov. 24 1953	Nov. 17 1953	Month Ago	Oct. Average
(1947-1949=100)	141.5	141.5	141.5	141.5

STEEL'S FINISHED STEEL PRICE INDEX

	Nov. 25 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38	189.38	181.31	151.86
Index in cents per lb.	5.130	5.130	5.130	4.912	4.114

STEEL'S ARITHMETICAL PRICE COMPOSITE*

	Nov. 25 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$115.18	$115.18	$115.18	$110.98	$95.50
No. 2 Fdry. Pig Iron, GT.	56.54	56.54	56.54	55.04	46.96
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.23
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	34.67	35.00	33.83	43.00	42.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Nov. 25 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Conshohocken, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.775-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.50	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	6.20-6.85	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝", Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton

	Nov. 25 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld., Phila.	60.75	60.75	60.75	59.25	50.17
No. 2 Fdry., Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry., Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry., Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry., deld., Phila.	61.25	61.25	61.25	59.75	50.67
No. 2 Fdry., Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry. (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt., Pitts.	$35.50	$36.50	$36.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	35.00	35.00	31.50	41.50	45.25
No. 1 Heavy Melt, Chicago	33.50	33.50	33.50	42.50	41.75
No. 1 Heavy Melt, Valley	34.50	35.50	35.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	32.50	33.50	32.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	34.50	34.50	34.50	43.00	48.50
Rails, Rerolling, Chicago	46.50	46.50	43.50	52.50	70.50
No. 1 Cast, Chicago	34.50	34.50	32.50	45.00	70.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven, Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 34.50, Lone star brand 35.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

DAILY NONFERROUS PRICE RECORD

	Price Nov. 25	Change	Previous Price	Oct. Avg.	Sept. Avg.	Nov. 1952 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.606	29.500	24.500
Lead	13.30	Sept. 16	13.80	13.300	13.540	13.965
Zinc	10.00	Sept. 11	10.50	10.000	10.180	12.500
Tin	87.00	Nov. 25	86.50	81.096	82.410	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.8%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, deld.; Magnesium, 99.8%, Freeport, Tex.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30-125 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.40, corroding 13.40, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

Mercury: Open market, spot, New York, $186-$189 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots, for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including inport duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz. nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $4.25-$4.75 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $42.45 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 87.00.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.25 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $6.30. Treated ingots $10.43.

Zinc: Prime western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 21.00-22.00; No. 12 foundry alloy (No. 2 grade) 20.25-21.25; 5% silicon alloy, 0.60 Cu max., 23.00-24.00; 13 alloy, 0.60 Cu max., 23.00-24.00; 195 alloy 22.00-22.75; 108 alloy 21.00-21.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00; grade 2, 20.50-21.00; grade 3, 19.50-20.00; grade 4, 17.50-18.50.

Brass Ingot: Red brass, No. 115, 24.50; tin bronze No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.50-22.25.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R. ..	86.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ..	84.5	66.5	90.5
Rod, Shapes ..	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)
Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (In.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.082-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.50. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.89	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 13.00; low copper clippings 13.50; mixed clippings 10.00; old sheet 10.00; borings and turnings 6.50-7.00; pistons and struts 7.00; crankcases 10.00; industrial castings 10.00.

Copper and Brass: Heavy copper and wire, No. 1 23.50; No. 2 copper 21.50; light copper 18.50-19.00; No. 1 composition red brass 17.00-17.25; No. 1 composition turnings 16.25-16.75; mixed brass turnings 11.00; new brass clippings 18.00; No. 1 brass rod turnings 13.00; light brass 10.25-10.50; heavy yellow brass 12.50-13.00; new brass rod ends 15.00; auto radiators, unsweated 13.00; cocks and faucets 14.50-15.00; brass pipe 16.25-16.50.

Lead: Heavy 10.00-10.50; battery plate 5.50-5.75; linotype and stereotype 12.00; electrotype 10.75; mixed babbitt 12.25.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 26.00-28.00; old sheet 24.00-26.00; turnings 19.00-21.00; rods 26.00-28.00.

Nickel: Sheets and clips 70.00; rolled anodes 70.00; turnings 40.00; rod ends 70.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S 3S clippings 15.00-16.00; 51S, 52S clippings 15.00-16.00; 14S, 17S, 24S, clippings 14.00-15.00; mixed clippings 14.00-14.75; old sheet 12.50-13.50; old cast 12.50-13.50; clean old cable, free of steel 15.00-16.00; borings and turnings 12.50-13.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 25.00; No. 2 copper 23.00; light copper 21.50; refinery brass (66% copper) per dry copper content 19.50; auto radiators 13.25 nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 25.00; No. 2 copper 23.50; light copper 22.00; No. 1 composition borings 17.00-18.00; No. 1 composition solids 17.50-18.50; heavy yellow brass solids 13.50-14.00; yellow brass turnings 12.50-12.75; radiators 13.50-14.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $3.15 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.75, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00, 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.015; 200-499 lb $1.03; 500-999 lb $1.025; 1000 lb or more $1.02.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000-lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.80; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.000; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.500; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 67.7; 100-500 lb 53.7; 500-1000 lb 51.1; 2000-9900 lb 49.4; 10,000 lb or more 48.3.

Stannous Chloride (Anhydrous): Less than 50 lb $1.527; 50 lb $1.18; 100-200 lb $1.05; 400-500 lb $1.013; 1000-1900 lb 96.8; 2000-4900 lb 94.2; 5000-19,000 lb 89.1; 20,000 lb and over 85.

Stannous Sulphate: Less than 50 lb $1.229; 50 lb 92.9; 100-1000 lb 90.9; 2000 lb and over 88.9.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Aluminum semifabricators have plenty of open capacity. That's why they want the Defense department to curtail its foreign buying

"SUBSTANTIAL AMOUNTS of open capacity are available for all classes of semifabricated aluminum products. The aluminum semifabricating industry is deeply concerned about keeping its mills and fabricating plants operating and its workers employed."

So says the Aluminum Association, representing 91 per cent of U. S. production of semifabricated products and over 40 per cent of aluminum castings produced by jobbing foundries.

"Hundreds of workers have been laid off at mills for lack of orders. There is available a substantial degree of open capacity throughout the industry, and there is no indication that there will be any lack of capacity in the future," continues the association, which reported foundry members' facilities have been operating at only 49 per cent of capacity this year.

Compelling Reasons—This frank revelation of the present status of the aluminum industry is found in a statement to the Defense department pointing out that domestic facilities are sufficient to fill all military and civilian orders. It's part of a controversy between the U. S. industry and importers over application of the Buy American act to aluminum mill forms and shapes.

So far the fight is a draw. Fancy footwork by the Defense department in side-stepping the controversy gives neither side a victory. In essence, procurement practices remain unchanged though interpretation of the act's coverage has supposedly been clarified. Rulings to date merely set the stage for a bigger showdown in the future.

What's It About?—Aluminum pig and ingot, classed as being in short supply, are exempt from provisions of the Buy American act by a Defense department directive of June, 1952, which is still operative. Some branches of the military have applied it to semifabricated products. "Clarification" last week by the Defense department limits coverage only to pig and ingot. Thus, shapes and forms are not exempt.

Three loopholes are present to allow importers to bid on government contracts: Cases where bids are 25 per cent below lowest domestic bid, when contract concerns material in short supply, when award of the contract abroad will be "in the public interest" by promoting mutual security. This last exception, broad as the plains except for a number of procurement requirements, is the white hope of importers. It could be interpreted differently in individual cases.

Diplomatic Pressure — Importers involved—there are less than 10 of them—say their business amounts to less than 2 per cent of total supply of fabricated products. England is predominant among nations shipping aluminum here, with Austria, West Germany, France and Belgium also in the act. Sheet is the chief tonnage import, though rod, wire, circles and some extrusions come in too. Two big U. S. aluminum companies have reportedly taken delivery within the last six months of foreign products (sheets from England, coil stock from France) to supply their distributors.

A letter to one big importing firm from the office of assistant secretary of defense for supply and logistics dated Oct. 21, 1953, said that following careful review, aluminum is interpreted to include procurement of mill forms and shapes as well as pig and ingot, and revision is not expected at this time. Importers claim they don't know where they stand and hope to get help from European embassies in Washington. Meantime, they'll wait to see if they get snubbed on future bids before taking action.

LEAD SHIPMENTS CLIMB

Domestic Shipments from Primary Refineries

1953	Net Tons
October	44,987
September	41,598
August	40,836
July	35,652
June	44,140
May	48,914
April	39,487
March	42,242
February	36,811
January	35,529

Source: American Bureau of Metal Statistics.

Still Pending: Chilean Copper

Other nonferrous markets maintained a near-normal holiday-week pace, though there's something in the wind besides rumors regarding the Chilean copper situation. Purchase pact with the U. S. for 100,000 tons of copper was reportedly before the Chilean senate last week for ratification. Despite the high-flown talk of deals in Europe and behind the Iron Curtain, this much is sure: The U. S. is on the hook for the bulk of Chile's accumulation. It's the only nation around with the money, the need and the capacity to absorb the huge tonnage without precipitating a serious market crisis.

Buoyants for Tin

Buoyants for tin prices came from two directions last week: News that the Geneva Conference was making progress on setting up a buffer pool to level prices, and reports that the U. S. wants to bolster the natural rubber market. Rubber is in much the same position marketwise today as tin.

Shipments Climb

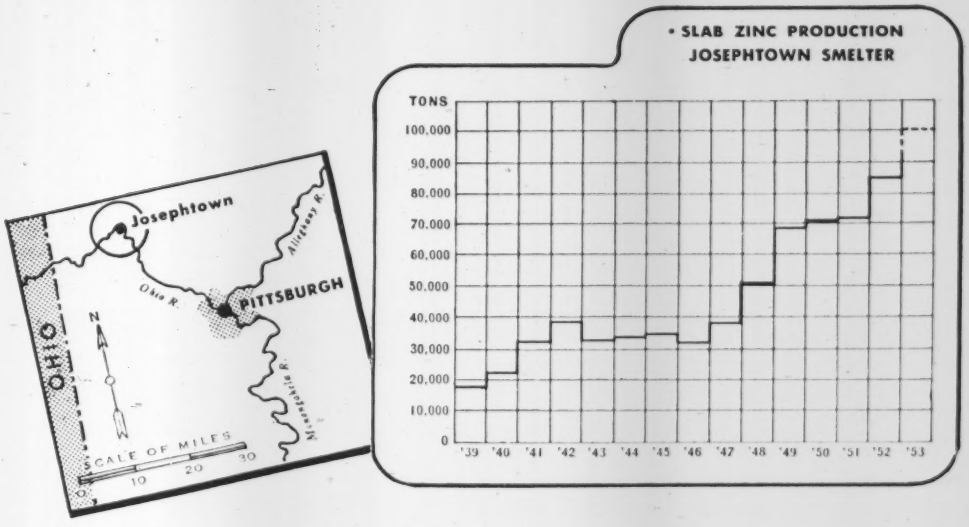
Good news for brass and bronze foundries can be found in steady shipment increases since August. Combined brass and bronze ingot shipments in October rose nearly 5 per cent to 22,280 tons, reports the Defense Council of the Ingot Brass & Bronze Industry.

Shipments of fabricated copper products in October rose 4454 tons to 116,259 tons and new orders increased nearly 15,000 tons to 97,221 tons on basis of copper required. Unfilled orders on fabricators' books going into November amount to 187,438 tons of refined copper, while stocks of the red metal amounted to 436,394 tons.

Nonferrous Briefs

- Advance release of storage water from Hungry Horse dam to aluminum companies by Bonneville Power Administration—enough to produce 7500 tons of aluminum—has been made possible by favorable water conditions in the Northwest.
- Continuous roller-hearth furnace 64 feet long to heat 24,000 lbs of brass slabs per hour to 1500° F is being installed at Winchester Repeating Arms Division, Olin Industries, New Haven, Conn.

"For reliability of supply and unquestioned quality — SPECIFY DOMESTIC ZINC"



TONS
DOMESTIC SLAB ZINC PRODUCTION
IMPORTS OF SLAB ZINC
U.S. ZINC CONSUMERS... which would you prefer?
A brief study of these curves showing domestic slab zinc production in its relation to imports reveals some facts of interest to every consumer. In periods of greatest necessity, imports of zinc are at their lowest, as for example in 1948 and 1951. Conversely, when there is an abundant supply, imports are at their highest level. As a result, prices decline and domestic zinc production is discouraged — production which may be vitally needed on very short notice. As a matter of fact, the alternate withholding and flooding of the domestic market with foreign zinc has been responsible for some of the wide fluctuations in the domestic price which is so disturbing to the American consumer.
The price concessions offered by importers in easy markets rarely offset the premiums or inconveniences caused by lack of availability of the same metal in tight markets. Furthermore, many grades of imported zinc are not comparable in quality to primary domestic brands produced to A.S.T.M. specifications. In other words, it is not a question of dollars and cents alone.
For reliability of supply and unquestioned quality — SPECIFY DOMESTIC ZINC
ST. JOSEPH LEAD COMPANY
250 PARK AVENUE, NEW YORK 17, N.Y.
BUNKER HILL ... ZINC • ST. JOE electrothermic ZINC (High Grade, Intermediate, Brass Special, Prime Western)

The above recently appeared as a full page ad in a number of national trade publications.

A major factor in domestic zinc supply is the St. Joseph Lead Company's electrothermic smelter at Josephtown, Pa. Constructed in 1930, the smelter's annual slab zinc production is now in excess of 100,000 tons and — based on the current expansion program — will continue to rise. This steady growth of production is the direct result of two factors: 1 — The strategic location of the plant to major consuming centers. 2 — The consumers' confidence in the quality of St. Joe Zinc and the integrity of the producer in dealing with his customers.

ST. JOSEPH LEAD COMPANY
250 Park Avenue • New York 17, N.Y.

HIGH GRADE • INTERMEDIATE
BRASS SPECIAL • PRIME WESTERN

ST. JOE
electrothermic
ZINC

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 155. Key to footnotes, page 157.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)

Fontana,Calif. K1	$86.00
Munhall,Pa. U5	59.00

INGOTS, Alloy (NT)

Detroit R7	$63.00
Fontana,Calif. K1	88.00
Midland,Pa. C18	62.00
Munhall,Pa. U5	62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)

Aliquippa,Pa. J5	$62.00
Bessemer,Pa. U5	62.00
Clairton,Pa. U5	62.00
Ensley,Ala. T2	62.00
Fairfield,Ala. T2	62.00
Fontana,Calif. K1	76.00
Gary,Ind. U5	62.00
Johnstown,Pa. B2	62.00
Lackawanna,N.Y. B2	62.00
Munhall,Pa. U5	62.00
So.Chicago,Ill. U5	62.00
So.Duquesne,Pa. U5	62.00

Carbon, Forging (NT)

Aliquippa,Pa. J5	$75.50
Bessemer,Pa. U5	75.50
Buffalo R2	75.50
Canton,O. R2	75.50
Clairton,Pa. U5	75.50
Cleveland R2	75.50
Conshohocken,Pa. A3	82.50
Detroit R7	78.50
Ensley,Ala. T2	75.50
Fairfield,Ala. T2	75.50
Fontana,Calif. K1	83.50
Gary,Ind. U5	75.50
Geneva,Utah C11	75.50
Houston S5	80.50
Johnstown,Pa. B2	75.50
Lackawanna,N.Y. B2	75.50
LosAngeles B3	94.50
Munhall,Pa. U5	75.50
Seattle B3	94.50
So.Chicago,Ill. R2, U5, W14	75.50
So.Duquesne,Pa. U5	75.50
So.SanFrancisco B3	94.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	$82.00
Buffalo R2	82.00
Canton,O. R2, T7	82.00
Conshohocken,Pa. A3	89.00
Detroit R7	84.00
Fontana,Calif. K1	101.00
Gary,Ind. U5	82.00
Houston S5	92.00
Ind.Harbor,Ind. Y1	82.00
Johnstown,Pa. B2	82.00
Lackawanna,N.Y. B2	82.00
LosAngeles B3	102.00
Massillon,O. R2	82.00
Midland,Pa. C18	82.00
Munhall,Pa. U5	82.00
So.Chicago,Ill. R2, U5, W14	82.00
So.Duquesne,Pa. U5	82.00
Struthers,O. Y1	82.00
Warren,O. C17	82.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$92.50
Canton,O. R2	92.50
Cleveland R2	92.50
Fontana,Calif. K1	113.50
Gary,Ind. U5	92.50
Massillon,O. R2	92.50
So.Chicago,Ill. R2	92.50
So.Duquesne,Pa. U5	92.50

SHEET BAR (NT)

Fontana,Calif. K1	$93.18

SKELP

Aliquippa,Pa. J5	3.85
Munhall,Pa. U5	3.75
Warren,O. R2	3.75
Youngstown R2, U5	3.75

WIRE RODS

Alabama City,Ala. R2	4.525
Aliquippa,Pa. J5	4.525
Alton,Ill. L1	4.70
Buffalo W12	4.525
Cleveland A7	4.525
Donora,Pa. A7	4.525
Fairfield,Ala. T2	4.525
Fontana,Calif. K1	5.325
Houston S5	4.925
Johnstown,Pa. B2	4.525
Joliet,Ill. A7	4.525
Kansas City,Mo. S5	4.86
LosAngeles B3	5.325
Minnequa,Colo. C10	4.775
Monessen,Pa. P5	4.725
No.Tonawanda,N.Y. B11	4.525
Pittsburg,Calif. C11	5.175
Portsmouth P12	4.525
Roebling,N.J. R5	4.625
So.Chicago,Ill. R2	4.525
Sparrows Point,Md. B2	4.625
Sterling,Ill.(1) N15	4.525
Struthers,O. Y1	4.525
Torrance,Calif. C11	5.325
Worcester,Mass. A7	4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes

Alabama City,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Bessemer,Ala. T2	4.10
Bethlehem,Pa. B2	4.15
Clairton,Pa. U5	4.10
Fairfield,Ala. T2	4.10
Fontana,Calif. K1	4.75
Gary,Ind. U5	4.10
Geneva,Utah C11	4.10
Houston S5	4.60
Ind.Harbor,Ind. I-2	4.10
Johnstown,Pa. B2	4.15
Kansas City,Mo. S5	4.80
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.80
Minnequa,Colo. C10	4.55
Munhall,Pa. U5	4.10
Niles,Calif. (22), P1	4.91
Phoenixville,Pa. P4	4.55
Seattle B3	4.85
So.Chicago,Ill. U5, W14	4.10
So.SanFrancisco B3	4.75
Torrance,Calif. C11	4.80
Weirton,W.Va. W6	4.35

Wide Flange

Bethlehem,Pa. B2	4.15
Clairton,Pa. U5	4.10
Fontana,Calif. K1	5.30
Lackawanna,N.Y. B2	4.15
Munhall,Pa. U5	4.10
So.Chicago,Ill. U5	4.10

Alloy Stand. Shapes

Clairton,Pa. U5	5.00
Fontana,Calif. K1	6.40
Gary,Ind. U5	5.00
Munhall,Pa. U5	5.00
So.Chicago,Ill. U5	5.00

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	6.175
Bessemer,Ala. T2	6.175
Bethlehem,Pa. B2	6.20
Clairton,Pa. U5	6.175
Fairfield,Ala. T2	6.175
Fontana,Calif. K1	6.825
Gary,Ind. U5	6.175
Geneva,Utah C11	6.175
Ind.Harbor,Ind. I-2	6.175
Ind.Harbor,Ind. Y1	6.675
Johnstown,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
LosAngeles B3	6.85
Munhall,Pa. U5	6.175
Seattle B3	6.90
So.Chicago,Ill. U5, W14	6.175
So.SanFrancisco B3	6.80
Struthers,O. Y1	6.675

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
Munhall,Pa. U5	6.125
So.Chicago,Ill. U5	6.125

BEARING PILES

Munhall,Pa. U5	4.10
So.Chicago,Ill. U5	4.10

—PILING—

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	4.925
Lackawanna,N.Y. B2	4.925
Munhall,Pa. U5	4.925
So.Chicago,Ill. U5	4.925

—PLATES—

PLATES, Carbon Steel

Alabama City,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Ashland,Ky. (15) A10	4.10
Bessemer,Ala. T2	4.10
Clairton,Pa. U5	4.10
Cleveland,J5, R2	4.10
Coatesville,Pa. L7	4.35
Conshohocken,Pa. A3	4.25
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Fontana,Calif.(30) K1	4.75
Gary,Ind. U5	4.10
Geneva,Utah C11	4.10
Granite City,Ill. G4	4.30
Harrisburg,Pa. C5	4.10
Houston S5	4.60
Ind.Harbor,Ind. I-2, Y1	4.10
Johnstown,Pa. B2	4.10
Lackawanna,N.Y. B2	4.10
Minnequa,Colo. C10	4.10
Munhall,Pa. U5	4.10
Newport,Ky. (15) A10	4.10
Niles,Calif. P1	4.85
No.Tonawanda,N.Y. B11	4.15
Pittsburg,Calif. C11	4.85
Pittsburgh J5	4.15
Portland,Oreg. O1	4.90
Seattle B3, N14	4.90
So.Chicago,Ill. R2, U5, W14	4.15
So.Duquesne,Pa. U5	4.15
So.SanFran.,Calif. B3	4.90
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Weirton,W.Va. W6	4.30
Youngstown R2, U5	4.15

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1	5.90
Geneva,Utah C11	5.25

PLATES, Wrought Iron

Economy,Pa. B14	9.30

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5	6.25
Bessemer,Ala. T2	6.25
Clairton,Pa. U5	6.25
Cleveland J5	6.25
Conshohocken,Pa. A3	6.25
Ecorse,Mich. G5	6.45
Fairfield,Ala. T2	6.25
Fontana,Calif.(30) K1	6.95
Gary,Ind. U5	6.25
Geneva,Utah C11	6.25
Ind.Harbor,Ind. I-2	6.25
Ind.Harbor,Ind. Y1	6.75
Johnstown,Pa. B2	6.25
Lackawanna,N.Y. B2	6.25
Munhall,Pa. U5	6.25
Pittsburgh J5	6.25
Seattle B3	7.15
Sharon,Pa. S3	6.25
So.Chicago,Ill. U5, W14	6.25
Sparrows Point,Md. B2	6.25
Youngstown U5	6.25
Youngstown Y1	6.75

PLATES, Alloy

Claymont,Del. C22	5.65
Coatesville,Pa. L7	5.75
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.55
Johnstown,Pa. B2	5.55
Munhall,Pa. U5	5.55
Sharon,Pa. S3	5.55
So.Chicago,Ill. U5, W14	5.55
Sparrows Point,Md. B2	5.55

FLOOR PLATES

Cleveland J5	5.15
Conshohocken,Pa. A3	5.15
Ind.Harbor,Ind. I-2	5.15
Munhall,Pa. U5	5.15
So.Chicago,Ill. U5	5.15

PLATES, Ingot Iron

Ashland,c.l. (15) A10	4.35
Ashland,l.c.l.(15) A10	4.85
Cleveland, c.l. R2	4.70
Warren,O. c.l. R2	4.70

—BARS—

BARS, Hot-Rolled Carbon

Alabama City,Ala. R2	4.15
Aliquippa,Pa. J5	4.15
Alton,Ill. L1	4.35
Atlanta,Ga. A11	4.40
Bessemer,Ala. T2	4.15
Buffalo R2	4.15
Canton,O. R2	4.15
Clairton,Pa. U5	4.15
Cleveland R2	4.15
Detroit R7	4.30
Ecorse,Mich. G5	4.35
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fairless,Pa. U5	4.30
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston S5	4.65
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
Kansas City,Mo. S5	4.85
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Massillon,O. R2, R8	4.15
Minnequa,Colo. C10	4.60
Niles,Calif. P1	4.85
No.Tonawanda,N.Y. B11	4.15
Pittsburg,Calif. C11	4.85
Pittsburgh J5	4.15
Portland,Oreg. O1	4.90
Seattle B3, N14	4.90
So.Chicago,R2, U5, W14	4.15
So.Duquesne,Pa. U5	4.15
So.SanFran.,Calif. B3	4.90
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Weirton,W.Va. W6	4.30
Youngstown R2, U5	4.15

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	4.875
Buffalo R2	4.875
Canton,O. R2, T7	4.875
Clairton,Pa. U5	4.875
Detroit R7	4.975
Ecorse,Mich. G5	5.075
Fontana,Calif. K1	5.925
Gary,Ind. U5	4.875
Houston S5	5.375
Ind.Harbor,Ind. I-2, Y1	4.875
Johnstown,Pa. B2	4.875
Kansas City,Mo. S5	5.575
Lackawanna,N.Y. B2	4.875
LosAngeles B3	5.925
Massillon,O. R2	4.875
Midland,Pa. C18	4.875
So.Chicago R2, U5, W14	4.875
So.Duquesne,Pa. U5	4.875
Struthers,O. Y1	4.875
Warren,O. C17	4.875
Youngstown U5	4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.225
Bessemer,Ala. T2	6.225
Bethlehem,Pa. B2	6.225
Clairton,Pa. U5	6.225
Ecorse,Mich. G5	6.425
Fairfield,Ala. T2	6.225
Fontana,Calif. K1	7.475
Gary,Ind. U5	6.225
Ind.Harb.,Ind. Y1	6.725
Ind.Harb.,Ind. I-2	6.225
Johnstown,Pa. B2	6.225
Lackawanna,N.Y. B2	6.225
LosAngeles B3	6.925
Pittsburgh J5	6.225
Seattle B3	6.975
So.Chicago,Ill. W14	6.225
So.Duquesne,Pa. U5	6.225
So.SanFrancisco B3	6.975
Struthers,O. Y1	6.725
Youngstown U5	6.225

BAR SIZE ANGLES, H.R. CARBON

Bethlehem,Pa. B2	4.35

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5	4.15
Atlanta A11	4.40
Niles,Calif. P1	4.85
SanFrancisco S7	5.10

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.00
Fontana,Calif. K1	6.00
Gary,Ind. U5	5.00
Houston S5	5.70
KansasCity S5	5.90
Youngstown U5	5.00

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	5.20
BeaverFalls,Pa. M12, R2	5.20
Buffalo B5	5.25
Camden,N.J. P13	5.65
Carnegie,Pa. C12	5.20
Chicago W18	5.20
Cleveland A7, C20	5.20
Detroit P17, R7	5.35
Detroit B5	5.40
Donora,Pa. A7	5.20
Elyria,O. W8	5.20
Franklin Park,Ill. N6	5.20
Gary,Ind. R2	5.20
GreenBay,Wis. F7	5.20
Hammond,Ind. L2, M13	5.20
Hartford,Conn. R2	5.75
Harvey,Ill. B5	5.20
LosAngeles B2	6.65
Mansfield,Mass. B5	5.75
Massillon,O. R2, R8	5.20
Monaca,Pa. S17	5.20
Newark,N.J. W18	5.65
NewCastle,Pa. (17) B4	5.20
Pittsburgh J5	5.20
Plymouth,Mich. P5	5.45
Putnam,Conn. W18	5.75
Readville,Mass. C14	5.75
St.Louis,Mo. M5	5.50
So.Chicago,Ill. W14	5.20
SpringCity,Pa. K3	5.65
Struthers,O. Y1	5.20
Waukegan,Ill. A7	5.20
Worcester,Mass. W19	6.10
Youngstown F3, Y1	5.20

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md. (5) C19	4.45

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.325
BeaverFalls,Pa. M12	6.325
Bethlehem,Pa. B2	6.325
Buffalo B5	6.325
Camden,N.J. P13	6.50
Canton,O. R2, T7	6.325
Carnegie,Pa. C12	6.325
Chicago W18	6.325
Cleveland A7, C20	6.325
Detroit P7	6.425
Detroit P17	6.475
Detroit B5	6.525
Donora,Pa. A7	6.325
Elyria,O. W8	6.325
Gary,Ind. R2	6.325
Hammond,Ind. L2, M13	6.325
Hartford,Conn. R2	6.775
Harvey,Ill. B5	6.325
Lackawanna,N.Y. B2	6.325
Mansfield,Mass. B5	6.775
Massillon,O. R2, R8	6.325
Midland,Pa. C18	6.325
Monaca,Pa. S17	6.325
Newark,N.J. W18	6.65
Plymouth,Mich. P5	6.525
So.Chicago,Ill. R2, W14	6.325
SpringCity,Pa. K3	6.475
Struthers,O. Y1	6.325
Warren,O. C17	6.325
Waukegan,Ill. A7	6.325
Worcester,Mass. A7	6.625
Youngstown F3, Y1	6.325

BARS, Reinforcing (Fabricators)

Alabama City,Ala. R2	4.15
Atlanta A11	4.40
Buffalo R2	4.15
Cleveland R2	4.15
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fairless,Pa. U5	4.30
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston S5	4.65
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. M18	4.15
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
Pittsburg,Calif. C11	4.85
Pittsburgh J5	4.15
SandSprings,Okla. S5	5.05
Seattle B3, N14	4.90
So.Chicago,Ill. R2	4.15
So.Duquesne,Pa. U5	4.15
So.SanFrancisco B3	4.90
SparrowsPoint,Md. B2	4.15
Sterling,Ill. (1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Youngstown R2, U5	4.15

BARS, Reinforcing (Fabricated; to consumers)

Johnstown, ¾-1" B2	5.55
KansasCity S5	6.35
LosAngeles B3	6.18
Marion,O. P11	5.55
Seattle N14	5.80
Seattle B3	6.25
So.SanFrancisco B3	6.25
SparrowsPt. ½-1" B2	5.55
Williamsport,Pa. S19	5.45

RAIL STEEL BARS

Axis,Pa.(1) J8	4.75
ChicagoHts.(3) C2	4.50
ChicagoHts.(4) C2	4.75
ChicagoHts.(3,4) I-2	4.50
FortWorth,Tex.(26) T4	4.65
Franklin,Pa.(3) F5	4.50
Franklin,Pa.(4) F5	4.75
Marion,O.(3) P11	4.50
Moline,Ill.(3) R2	4.50
Tonawanda,(3) B12	5.00
Williamsport,Pa.(3) S19	5.25
Williamsport,Pa.(4) S19	5.45

BARS, Wrought Iron

Economy,Pa.(S.R.) B14	10.40
Economy,Pa.(D.R.) B14	12.90
Economy(Staybolt) B14	13.20
McK Rks.(Staybolt) L5	15.50
McK Rks.(S.R.) L5	10.40
McK Rks.(D.R.) L5	14.00

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)

Alabama City,Ala. R2	3.925
Allenport,Pa. P7	3.925
Ashland,Ky.(8) A10	3.925
Butler,Pa. A10	3.925
Cleveland J5, R2	3.925
Conshohocken,Pa. A3	4.05
Detroit M1	4.15
Ecorse,Mich. G5	4.125
Fairfield,Ala. T2	3.925
Fairless,Pa. U5	4.025
Fontana,Calif. K1	4.70
Gary,Ind. U5	3.925
Geneva,Utah C11	4.025
Granite City,Ill. G4	4.125
Ind.Harbor,Ind. I-2, Y1	3.925
Irvin,Pa. U5	3.925
Kokomo,Ind. C16	4.025
Lackawanna,N.Y. B2	3.925

Munhall,Pa. U5 ..... 3.925
Newport,Ky. N9 ..... 3.925
Niles,O. N12 ..... 5.425
Pittsburg,Calif. C11 .. 4.625
Pittsburgh J5 ..... 3.925
Riverdale,Ill. A1 ..... 3.925
Sharon,Pa. S3 ..... 3.925
So.Chicago,Ill. W14 .. 3.925
SparrowsPoint,Md. B2 .. 3.925
Steubenville,O. W10 .. 3.925
Torrance,Calif. C11 .. 4.625
Warren,O. R2 ..... 3.925
Weirton,W.Va. W6 .. 3.925
Youngstown U5, Y1 .. 3.925

SHEETS, H.R. (19 gage)

AlabamaCity, Ala. R2 .. 5.225
Dover,O. R1 ..... 5.05
Mansfield,O. E6 ..... 5.05
Niles,O. N12 ..... 5.20
Torrance,Calif. C11 .. 5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 ..... 5.90
Conshohocken,Pa. A3 .. 5.90
Ecorse,Mich. G5 ..... 6.10
Fairfield,Ala. T2 ..... 5.90
Fontana,Calif. K1 ..... 6.75
Gary,Ind. U5 ..... 5.90
Ind Harbor,Ind. I-2 .... 5.90
Ind Harbor,Ind. Y1 .... 6.40
Irvin,Pa. U5 ..... 5.90
Lackawanna(35) B2 .... 5.90
Munhall,Pa. U5 ..... 5.90
Pittsburgh J5 ..... 5.90
Sharon,Pa. S3 ..... 5.90
So.Chicago,Ill. U5 .... 5.90
SparrowsPoint(38) B2 .. 5.90
Warren,O. R2 ..... 5.90
Weirton,W.Va. W6 .... 6.175
Youngstown U5 ..... 5.90
Youngstown Y1 ..... 6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 .. 4.175
Cleveland R2 ..... 4.525
Ind Harbor,Ind. I-2 .. 4.175
Warren,O. R2 ..... 4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ..... 4.775
Butler,Pa. A10 ..... 4.775
Cleveland J5, R2 ..... 4.775
Ecorse,Mich. G5 ..... 4.975
Fairfield,Ala. T2 ..... 4.775
Fairless,Pa. U5 ..... 4.825
Follansbee,W.Va. F4 .. 5.775
Fontana,Calif. K1 .... 5.875
Gary,Ind. U5 ..... 4.775
GraniteCity,Ill. G4 .... 4.975
Ind Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 ..... 4.775
Lackawanna,N.Y. B2 .. 4.775
Middletown,O. A10 .... 4.775
Pittsburg,Calif. C11 .. 5.725
Pittsburgh J5 ..... 4.775
SparrowsPoint,Md. B2 4.775
Steubenville,O. W10 .. 4.775
Warren,O. R2 ..... 4.775
Weirton,W.Va. W6 .... 4.775
Youngstown Y1 ..... 4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ..... 7.225
Ecorse,Mich. G5 ..... 7.425
Fontana,Calif. K1 .... 8.275
Gary,Ind. U5 ..... 7.225
IndianaHarbor,Ind. Y1 7.725
Irvin,Pa. U5 ..... 7.225
Lackawanna(37) B2 .... 7.225
Pittsburgh J5 ..... 7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 ..... 7.225
Weirton,W.Va. W6 .... 7.475
Youngstown Y1 ..... 7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 ..... 5.275
Cleveland R2 ..... 5.375
Middletown,O. A10 .... 5.275
Warren,O. R2 ..... 5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 .. 5.275
Ashland,Ky. (8) A10 .. 5.275
Canton,O. R2 ..... 5.275
Dover,O. R1 ..... 5.275
Fairfield,Ala. T2 .... 5.275†
Gary,Ind. U5 ..... 5.275†
GraniteCity,Ill. G4 .... 5.475
Ind Harbor,Ind. I-2 .... 5.325
Irvin,Pa. U5 ..... 5.275†
Kokomo,Ind.(13), C16 .. 5.375
MartinsFerry,O. W10 .. 5.275
Niles,O. N12 ..... 5.80
Pittsburg,Calif. C11 .. 6.025†
SparrowsPoint,Md. B2 .. 5.275
Steubenville,O. W10 .. 5.275
Torrance,Calif. C11 .. 6.275†
Weirton,W.Va. W6 .... 5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 ..... 7.925
SparrowsPoint(39) B2 .. 8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 .... 5.525
Canton,O. R2 ..... 6.025

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.525	....
MartinsFry.,O W10	6.075	....
Pitts.,Cal. C11	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	6.825	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.575
Fairfield, Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.825
Irvin,Pa. U5 ..... 5.825†
Kokomo,Ind.(13) C16 .. 5.925
Niles,O. N12 ..... 6.35

†Based on 5c zinc.

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 ..... 5.525
Middletown,O. A10 .... 5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 ..... 5.775
Middletown,O. A10 .... 5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 .... 5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 ..... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 .. 5.175
Cleveland R2 ..... 5.175
Gary,Ind. U5 ..... 5.175
GraniteCity,Ill. G4 .. 5.875
Ind Harbor,Ind. I-2 .. 5.175
Irvin,Pa. U5 ..... 5.175
Middletown,O. A10 .... 5.175
Niles,O. N12 ..... 6.775
Youngstown Y1 ..... 5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 ..... 7.20
Follansbee,W.Va. F4 .. 7.30
Follansbee (23) F4 .. 7.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 ..... 5.675
Mansfield,O. E6 ..... 5.675
Middletown,O. A10 .... 5.675
Niles,O. N12 ..... 6.00
Weirton,W.Va. W6 .... 5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .... 6.075

SHEETS, Well Casing

Fontana,Calif. K1 .... 6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 .. 3.925
Allenport,Pa. P7 ..... 3.925
Alton,Ill. L1 ..... 4.10
Ashland,Ky.(8) A10 .. 3.925
Atlanta A11 ..... 4.175
Bessemer,Ala. T2 ..... 3.925
Bridgeport,Conn.(10)S15 4.15
Buffalo (27) R2 ..... 3.925
Butler,Pa.(8) A10 .... 3.925
Carnegie,Pa. S18 .... 4.425
Conshohocken,Pa. A3 .. 4.05
Detroit M1 ..... 4.15
Ecorse,Mich. G5 ..... 4.125
Fairfield,Ala. T2 .... 3.925
Fontana,Calif. K1 .... 4.70
Gary,Ind. U5 ..... 3.925
Houston,Tex. S5 ..... 4.425
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 3.925
KansasCity,Mo.(9) S5 4.625
Lackawna,N.Y.(32) B2 3.925
LosAngeles(25) B3 .... 4.675
Milton,Pa. M18 ..... 3.925
Minnequa,Colo. C10 .... 5.025
NewBritain(10) S15 .... 4.15
N.Tonawanda,N.Y.B11 3.925
Pittsburg,Calif. C11 .. 4.675
Riverdale,Ill. A1 ..... 3.925
SanFrancisco S7 ..... 5.10
Seattle(25) B3 ..... 4.925
Seattle N14 ..... 4.925
Sharon,Pa. S3 ..... 3.925
So.Chicago,Ill. W14 .. 3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2 3.925
Torrance,Calif. C11 .. 4.675
Warren,O. R2 ..... 3.925
Weirton,W.Va. W6 .... 4.025
Youngstown Y1, U5 .. 3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 ..... 6.40
Fontana,Calif. K1 ..... 7.80
Gary,Ind. U5 ..... 6.40
Houston,Tex. S5 ..... 6.90
KansasCity,Mo. S5 .... 7.10
LosAngeles B3 ..... 7.60
NewBritain,Conn.(10)S15 6.45
Sharon,Pa. S3 ..... 6.40
So.Chicago W14 ..... 6.40
Youngstown U5 ..... 6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ..... 5.65
Conshohocken,Pa. A3 .. 5.90
Ecorse,Mich. G5 ..... 6.15
Fairfield,Ala. T2 ..... 5.65
Fontana,Calif. K1 .... 7.05
Gary,Ind. U5 ..... 5.95
Ind Harbor,Ind. I-2 .... 5.95
Ind Harbor,Ind. Y1 .... 6.45
Lackawanna,N.Y. B2 .. 6.00
LosAngeles(25) B3 .... 6.40
Seattle(25) B3 ..... 6.65
Sharon,Pa. S3 ..... 5.95
So.SanFrancisco(25)B3 6.40
SparrowsPoint,Md. B2 .. 6.00
Warren,O. R2 ..... 5.95
Weirton,W.Va. W6 .... 6.30
Youngstown Y1 ..... 6.45
Youngstown U5 ..... 5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 .. 4.175
Warren,O. R2 ..... 4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 ..... 5.80
Bridgeprt,Conn. (10)S15 5.75
Butler,Pa. A10 ..... 5.45
Cleveland A7, J5 ..... 5.45
Dearborn,Mich. D3 .... 5.70
Detroit D2, P20 ..... 5.70
Detroit M1 ..... 5.65
Dover,O. G6 ..... 5.80
Ecorse,Mich. G5 ..... 5.65
Follansbee,W.Va. F4 .. 5.45
Fontana,Calif. K1 .... 7.35
Franklin Park,Ill. I5 .. 5.70
Ind Harbor,Ind. I-2 .... 5.70
Lackawanna,N.Y. B2 .. 5.45
LosAngeles C1 ..... 7.50
Mattapan,Mass. T6 .... 6.30
Middletown,O. A10 .... 5.45
NewBedford,Mass. R10 .. 6.40
NewBritain(10) S15 .... 5.75
NewCastle,Pa. B4 .... 5.45
NewCastle,Pa. E5 .... 5.45
NewHaven,Conn. A7 .... 5.95
NewHaven,Conn. I2 .... 6.20
Pawtucket,R.I. R3 .... 6.80
Pawtucket,R.I.(21) N8 .. 6.65
Riverdale,Ill. I1 ..... 5.70
Rome,N.Y.(29) R6 .... 5.45
Sharon,Pa. S3 ..... 5.45
SparrowsPoint,Md. B2 .. 5.45
Trenton,N.J. R5 ..... 7.00
Wallingford,Conn. W2 .. 6.20
Warren,O.(40) I5 ..... 5.45
Warren,O. B9 ..... 5.75
Warren,O. R2 ..... 5.45
Weirton,W.Va. W6 .... 5.45
Worcester,Mass. W19 .... 7.05
Youngstown C8 ..... 5.95
Youngstown Y1 ..... 5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 ..... 12.00
Cleveland A7 ..... 12.00
Dover,O. G6 ..... 12.00
Fontana,Calif. K1 .... 13.65
Harrison,N.J. C18 .... 12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8 12.45
Sharon,Pa. S3 ..... 12.00
Worcester,Mass. A7 .... 12.30
Youngstown C8 ..... 12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 ..... 7.80
Cleveland A7 ..... 8.15
Dearborn,Mich. D3 .... 7.90
Dover,O. G6 ..... 8.00
Ecorse,Mich. G5 ..... 8.35
Lackawanna,N.Y. B2 .. 8.15
Sharon,Pa. S3 ..... 7.65
SparrowsPoint,Md. B2 .. 8.15
Warren,O. R2 ..... 7.60
Weirton,W.Va. W6 .... 8.30
Youngstown Y1 ..... 8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ..... 6.05

STRIP, Electrogalvanized

Dover,O. G6 ..... 5.70
Warren,O. I5 ..... 5.45
Weirton,W.Va. W6 .... 5.45
Youngstown C8 ..... 5.95

TIGHT COOPERAGE HOOP

Atlanta A11 ..... 4.65
Riverdale,Ill. A1 ..... 4.50
Sharon,Pa. S3 ..... 4.35
Youngstown U5 ..... 4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Fifth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Kenkuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lorkhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Madart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Molitrap Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Electric Steel

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwst Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div. Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanely Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.

U4 Universal Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Betsy,O C7		8.00	8.60	10.55	12.85
Bridgeport,Conn C10	S15 5.75	7.65	8.60	10.55	12.85
Bristol,Conn W1			8.60	10.55	
Carnegie,Pa S15		7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich D3	5.70	7.85	8.60		
Detroit D2	6.45	7.85	8.45	10.55	
Dover,O G6	6.05	8.00	8.60	10.55	12.85
Franklin Park,Ill T6	5.50	7.80	8.75	10.70	
Harrison,N J C15			8.60	10.85	13.15
Mattapan,Mass T6	6.30	7.95	8.60	10.85	13.15
New Brit'n,Conn C10	S15 5.75	7.65	8.60	10.55	12.85
New Castle,Pa B4	5.45	7.65	8.60		
New Castle,Pa E5	5.95	8.00	8.60	10.55	12.85
New Haven,Conn D2	6.70	7.95	8.55	10.50	
New York W3		8.30	8.90	10.85	13.15
Pawtucket,R I N8					
Cleve or Pitts Base		8.00	8.60	10.55	12.85
Worcester,Mass Base	6.65	7.95	8.60	10.85	13.15
Sharon,Pa S3	5.45	7.65	8.60	10.55	12.85
Trenton,N J R5		7.95	8.60	10.85	13.15
Wallingford,Conn W2	6.20	7.95	8.60	10.85	13.15
Warren,O T2	5.45	7.65	8.60	10.55	12.85
Weirton,W Va W6	5.50	8.00	8.60	10.55	12.85
Worcester,Mass A7	5.75	7.95	8.60	10.85	13.15
Youngstown C8	5.50	7.95	8.60	10.85	13.15
		8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn W1			12.50	15.00	
Franklin Park,Ill T6			12.50	15.00	18.00
Harrison,N J C15			12.50	15.00	18.00
New York W3			12.50	15.00	18.00
Trenton,N J R5			12.50	15.00	18.00
Worcester,Mass T6			12.50	15.00	18.00
Youngstown C8			12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H R or C R (22 Ga.) COILS (cut lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W Va (cut lengths)			8.35	9.60	10.40
Brackenridge,Pa A4			8.85	10.10	10.90
Granite City,Ill G4 (cut lengths)			8.35	9.60	
Indiana Harbor,Ind I-2	8.05	8.35	8.85	C21	
Mansfield,O E6 (cut lengths)	7.50	7.85	8.35	9.60	10.40
Newport,Ky N9 (cut lengths)		7.85	8.35	9.60	10.40
Niles,O N12 (cut lengths)	7.50	7.85	8.35		
Vandergrift,Pa U5			8.35	8.85	10.10 10.90
Warren,O R2			8.35	8.85	10.10 10.90
Zanesville,O A10	8.00	8.35	8.85	10.10	10.90
			8.35	8.85	10.10 10.90

SHEET, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
Beech Bottom,W Va (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa A4	11.45			
Newport,Ky N9 (cut lengths)	10.95			
Vandergrift,Pa U5	11.45	12.00	12.70	13.50
Warren,O R2	11.45			
Zanesville,O A10	11.45	12.00	12.70	13.50

H R or C R COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa A10 (C R)			16.05	16.55
Vandergrift,Pa U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa J5	$7.40	$7.60	$8.05
Fairfield,Ala T2	7.50	7.75	8.15
Fairless,Pa U5	7.50	7.75	8.15
Gary,Ind U5	7.40	7.60	8.05
Granite City,Ill G4	7.60	7.85	8.25
Indiana Harbor,Ind I-2 Y1	7.40	7.60	8.05
Irvin,Pa U5	7.40	7.60	8.05
Niles,O R2	7.40	7.65	8.05
Pittsburg,Calif C11	8.15	8.40	8.80
Sparrows Point,Md B2	7.50	7.75	8.15
Weirton,W Va W6	7.40	7.60	8.05
Yorkville,O W10	7.40	7.60	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa J5	$8.70	$8.95
Fairfield,Ala T2	8.80	9.05
Fairless,Pa U5	8.80	9.05
Gary,Ind U5	8.70	8.95
Ind Har,Ind I-2, Y1	8.70	8.95
Irvin,Pa U5	8.70	8.95
Pitts,Calif C11	9.45	9.70
Sp Pt,Md B2	8.80	9.05
Warren,O R2	8.70	
Weirton,W Va W6	8.70	8.95
Yorkville,O W10	8.70	8.95

BLACK PLATE (Base Box)

Aliquippa,Pa J5	$6.50
Fairfield,Ala T2	6.60
Fairless,Pa U5	6.60
Gary,Ind U5	6.50
Granite City,Ill G4	6.70
Ind Harbor,Ind I-2 Y1	6.50
Irvin,Pa U5	6.50
Niles,O R2	6.50
Pittsburg,Calif C11	7.25
Sparrows Point,Md B2	6.60
Warren,O R2	6.50
Weirton,W Va W6	6.50
Yorkville,O W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W Va F4	6.10
Gary,Ind U5	6.10
Granite City,Ill G4	6.30
Ind Harbor,Ind Y1	6.10
Irvin,Pa U5	6.10
Yorkville,O W10	6.55

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala T2	$7.85
Gary,Ind U5	7.75
Irvin,Pa U5	7.75
Yorkville,O W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)

Gary,Ind U5	$9.75
Yorkville,O W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb

Yorkville,O W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon

Alabama City,Ala R2	5.525
Aliquippa,Pa J5	5.525
Alton,Ill L1	5.70
Atlanta A11	5.775
Bartonville,Ill K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20	5.525
Crawfordsville,Ind Ms	5.625
Donora,Pa A7	5.525
Duluth,Minn A7	5.525
Fairfield,Ala T2	5.525
Fostoria,O C24, S1	5.75
Houston S5	5.925
Johnstown,Pa B2	5.625
Joliet,Ill A7	5.525
Kansas City,Mo S5	6.125
Kokomo,Ind C16	5.625
Los Angeles B3	6.475
Minnequa,Colo C10	5.775
Monessen,Pa P7	5.525
So Tonawanda B11	5.525
Palmer,Mass W12	5.525
Pittsburg,Calif C11	6.475
Portsmouth,O P12	5.525
Rankin,Pa A7	5.525
So Chicago,Ill R2	5.525
So San Francisco C10	6.475
Sparrows Point,Md B2	5.625
Sterling,Ill C1, N15	5.525
Struthers,O Y1	5.525
Torrance,Calif C11	6.475
Waukegan,Ill A7	5.525
Worcester,Mass A7	5.825

WIRE, MB Spring, High Carbon

Aliquippa,Pa J5	6.925
Alton,Ill L1	7.10
Bartonville,Ill K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa A7	6.925
Duluth,Minn A7	6.925
Fostoria,O S1	6.925
Johnstown,Pa B2	6.925
Millbury,Mass C12, N6	8.725
Minnequa,Colo C10	7.175
Monessen,Pa P7	6.925
Monessen,Pa P16	6.95
Muncie,Ind I-7	7.125
Palmer,Mass W12	7.225
Pittsburg,Calif C11	7.875
Portsmouth,O P12	6.925
Roebling,N J R5	7.225
So Chicago,Ill R2	6.925
So San Fran C10	7.875
Sparrows Pt,Md B2	7.025
Struthers,O Y1	6.925
Trenton,N J A7	7.225
Waukegan,Ill A7	6.925
Worcester,Mass A7, J4	7.225
Worcester,Mass T6, W12	7.225

WIRE, Upholstery Spring

Aliquippa,Pa J5	6.625
Alton,Ill L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa A7	6.625
Duluth,Minn A7	6.625
Johnstown,Pa B2	6.625
Los Angeles B3	7.375
Minnequa,Colo C10	6.875
Monessen,Pa P7, P16	6.625
New Haven,Conn A7	6.925
Palmer,Mass W12	6.925
Pittsburg,Calif C11	7.575
Portsmouth,O P12	6.625
Roebling,N J R5	6.925
So Chicago,Ill R2	6.625
So San Francisco C10	7.575
Sparrows Point,Md B2	6.725
Torrance,Calif C11	7.575
Trenton,N J A7	6.925
Waukegan,Ill A7	6.625
Worcester,Mass A7, T6	10.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill K4	9.50
Johnstown,Pa B2	9.50
Monessen,Pa P16	9.50
Muncie,Ind I-7	9.70
Roebling,N J R5	9.80
Sparrows Pt,Md B2	9.60

WIRE, Fine & Weaving (8" Coils)

Alton,Ill L1	10.75
Bartonville,Ill K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind Ms	10.55
Fostoria,O S1	10.55
Johnstown,Pa B2	10.55
Kokomo,Ind C16	10.55
Monessen,Pa P16	10.55
Muncie,Ind I-7	10.75
Palmer,Mass W12	10.85
Roebling,N J R5	10.85
So San Francisco C10	10.90
Waukegan,Ill A7	10.55
Worcester,Mass A7, T6	10.85

ROPE WIRE (A)

Alton,Ill L1	9.45
Bartonville,Ill K4	9.35
Buffalo W12	9.35
Fostoria,O S1	9.35
Johnstown,Pa B2	9.35
Monessen,Pa P7, P16	9.35
Muncie,Ind I-7	9.55
Palmer,Mass W12	9.65
Portsmouth,O P12	9.35
Roebling,N J R5	9.65
Sparrows Pt B2	9.45
Struthers,O Y1	9.35
Worcester,Jl, T6	9.65
(A) Plow and Mild Plow; add 0.25c for improved plow.	

WIRE, Tire Bead

Alton,Ill L1	12.75
Bartonville,Ill K4	12.65
Monessen,Pa P16	12.90
Roebling,N J R5	12.85

WIRE, Cold-Rolled Flat

Anderson,Ind G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind Ms	7.55
Dover,O G6	7.45
Fostoria,O S1	7.45
Kokomo,Ind C16	7.55
Franklin Park,Ill T6	7.60
Massillon,O R8	7.45
Monessen,Pa P16	8.00
Monessen,Pa P7	7.45
Pawtkt,R I C12, N8	7.75
Trenton,N J R5	7.75
Worcester,A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
Ala City,Ala R2	6.675	7.075**
Aliquippa,Pa J5	6.675	7.26*
Atlanta A11	6.925	7.475
Bartonville,Ill K4	6.675	7.225
Buffalo W12	6.675	7.075
Cleveland A7	6.675	
Crawfordsville Ms	6.775	7.325
Donora,Pa A7	6.675	7.075†
Duluth,Minn A7	6.675	7.075†
Fairfield,Ala T2	6.675	7.075†
Houston,Tex S5	7.075	7.475
Johnstown,Pa B2	6.675	7.225
Joliet,Ill A7	6.675	7.075†
Kansas City,Mo S4	7.275	7.675
Kokomo,Ind C16	6.775	7.175
Los Angeles B3	7.025	
Minnequa,Colo C10	6.925	7.325**
Monessen,Pa P7	6.675	7.225
Palmer,Mass W12	6.975	7.375
Pitts,Calif C11	7.625	8.025
Pittsmth,O P12	6.675	
Rankin,Pa A7	6.675	7.075†
So Chicago,Ill R2	6.675	7.075**
So S Fran,Calif C10	7.625	8.025
Sparrows Pt,Md B2	6.775	7.325
Sterling,Ill C1, N15	6.675	7.225
Struthers,O Y1	6.675	7.175
Worcester,A7	6.975	

*Based on 10c zinc; †50c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

Alabama City,Ala R2	149
Atlanta A11	152
Bartonville,Ill C10, K4	149
Crawfordsville,Ind Ms	151
Donora,Pa A7	149
Duluth,Minn A7	149
Fairfield,Ala T2	149
Joliet,Ill A7	149
Kansas City,Mo S5	161
Kokomo,Ind C16	151
Minnequa,Colo C10	154
Pittsburg,Calif C11	173
So Chicago,Ill R2	149
So San Fran,Calif C10	173
Sparrows Point,Md B2	151
Sterling,Ill C1, N15	149

WOVEN FENCE, 9-15½ Ga. Col.

Ala City,Ala R2	140**
Ala City 17 ga R2	235**
Ala City 18 ga R2	245**
Aliquippa,Pa 9-14½ ga J5	143*
Atlanta A11	146
Bartonville,Ill C10, K4	143
Crawfordsville,Ind Ms	145
Donora,Pa A7	140*
Duluth,Minn A7	140*
Fairfield,Ala T2	140*
Houston,Tex S5	148
Johnstown,Pa B2	143
Johnstown 17 ga 67B2	234
Johnstown 4* B2	237
Joliet,Ill A7	140*
Kansas City,Mo S5	152
Kokomo,Ind C16	142
Minnequa,Colo C10	148**
Monessen,Pa 9 ga P7	145
Pittsburg,Calif C11	163
Rankin,Pa A7	140*
So Chicago,Ill R2	140**
Sterling,Ill C1, N15	143

†Based on 5c zinc; *11c zinc; **Subject to zinc equalization extras.

WIRE, Barbed Col.

Alabama City R2	153**
Aliquippa J5	150*
Atlanta A11	159
Bartonville,Ill C10, K4	156
Crawfordsville,Ind Ms	159
Donora,Pa A7	153†
Duluth,Minn A7	153†
Fairfield,Ala T2	153†
Houston,Tex S5	161
Johnstown,Pa B2	156
Joliet,Ill A7	153
Kansas City,Mo S5	165
Kokomo,Ind C16	155
Minnequa,Colo C10	159**
Monessen,Pa P7	157
Pittsburg,Calif C11	173†
Rankin,Pa A7	153†
So Chicago,Ill R2	153**
S San Francisco C10	173**
Sparrows Point,Md B2	158
Sterling,Ill C1, N15	143

†Based on 5c zinc; *11c zinc; **Subject to zinc equalization extras.

WIRE, (16 gage) Stone	An'ld. Galv. Stone
Ala City R2	12.50 14.05**
Aliquippa J5	10.63 12.72*
Bartonville,Ill K4	10.73 12.51
Cleveland A7	12.50
Crawfordsville,Ms	12.50 14.35
Fostoria,O S1	12.60 14.15
Johnstown B2	12.50 14.35
Kokomo C16	12.60 14.15
Minnequa C10	12.75 14.45**
Palmer,Mass W12	12.50 14.05
Pitts.,Calif C11	12.85 14.40†
So Chicago R2	12.50 14.05**
Sparrows Pt B2	12.60 14.45
Sterling,Ill C1, N15	10.73 12.15
Waukegan A7	12.50 14.05†
Worcester A7	12.80

*Based on 11c zinc; †5c zinc; **Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7) Col.

Alabama City,Ala R2	131
Aliquippa,Pa J5	131
Atlanta A11	134
Bartonville,Ill C10, K4	131
Chicago,Ill W13	131
Cleveland A9	137
Crawfordsville,Ind Ms	133
Donora,Pa A7	131
Duluth,Minn A7	131
Fairfield,Ala T2	131
Galveston,Tex D7	139
Houston,Tex S5	139
Johnstown,Pa B2	131
Joliet,Ill A7	131
Kansas City,Mo S5	143
Kokomo,Ind C16	133
Minnequa,Colo C10	136
Monessen,Pa P7	131
Pittsburg,Calif C11	150
Portsmouth,O P12	132
Rankin,Pa A7	131
So Chicago,Ill R2	131
Sparrows Pt,Md B2	133
Sterling,Ill C1, N15	131
Worcester,Mass A7	137

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa A3	$5.00
Wheeling,W Va W10	5.00

STAPLES, Polished, Stock To dealers & mfrs. (7) Col.

Alabama City,Ala R2	133
Aliquippa,Pa J5	133
Atlanta A11	136
Bartonville,Ill C10, K4	133
Crawfordsville,Ind Ms	135
Donora,Pa A7	133
Duluth,Minn A7	133
Fairfield,Ala T2	133
Johnstown,Pa B2	133
Joliet,Ill A7	133
Kokomo,Ind C16	135
Minnequa,Colo C10	138
Monessen,Pa P7	133
Pittsburg,Calif C11	152
Portsmouth,O P12	132
Rankin,Pa A7	133
So Chicago,Ill R2	133
Sparrows Pt,Md B2	135
Sterling,Ill C1, N15	133
Worcester,Mass A7	139

—FENCE POSTS—

	Col.
Chicago Hts.,Ill C2, I-2	145
Duluth,Minn A7 C10	136
Franklin,Pa F5	145
Johnstown,Pa B2	145
Marion,O P11	145
Minnequa,Colo C10	150
Moline,Ill R2	145
So Chicago,Ill R2	145
Tonawanda,N Y B12	148
Williamsport,Pa S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes, Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15-15	list	19-15	2.5	22.5	5	23.5	6.5	23.5	6.5	23	6.25	25.5	8.25
Ambridge, Pa. N2 (‡)	15-15	...	19-15	...	22.5	...	23.5	...	23.5	...	23	...	25.5	...
Lorain, O. N3 (*)	15-15	4.5	19-15	5.5	22.5	8	23.5	9.5	23.5	9.5	23	8.25	25.5	11.25
Youngstown Y1 (‡‡)	15-15	list	19-15	2.5	22.5	5	23.5	6.5	23.5	6.5	23	6.25	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15-15	6.75	19-15	3	22.5	5.5	23.5	7	23.5	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes, Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c		37c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73		3.68	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.25	36.75	20
Alton, Ill. L1 (§)	...	...	...	...	...	...	24.25	6	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25	34.75	18
Benwood, W. Va. W10(††)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5	36.75	20
Butler, Pa. F6 (‡)	26.5	+2.75	18.5	+7.25	12.5	+13	...	...	...	...	...	...	...	...	...	...	...	...
Etna, Pa. N2 (‡)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25	36.75	18.5
Fontana, Calif. K1 (‡)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5	23.75	8
Ind. Harbor Y1 (‡‡)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5	35.75	19
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24	36.75	25
Sharon, Pa. S4 (‡)	26.5	+0.25	19.5	+4.25	12.5	+8.5	...	...	...	...	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25	36.75	21
Sparrows Pt., Md. B2 (‡)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5	34.75	18
Youngstown R2 (**)	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25	36.75	21
Youngstown Y1 (‡‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5	36.75	20
Wheatland, Pa. W9 (‡)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5	36.75	20

Size, Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	...	...	...	...
Benwood, W. Va. W10(††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. N2 (‡)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	...	...	...	...
Ind. Harbor, Ind. Y1 (‡‡)	34.25	19	35.75	19	35.75	19	...	...	...	...
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	...	...	...	...
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	...	...	...	...
Sparrows Pt., Md. B2 (‡)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (‡‡)	35.25	20	36.75	20	36.75	20+	...	...	...	...
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...

Galvanized pipe discounts based on zinc price of: (†), 11c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (‡‡), 10.50c-11.50c; with discounts adjusted on prices of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13		21.31	18.44
1¼	13		25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.10	44.75	32.41
2¾	12	40.51	48.86	35.70
3	12	43.85	52.90	38.66
3½	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
Bessemer, Pa. U5	4.325	4.225	4.275	5.20
Ensley, Ala. T2	4.325	4.225	...	5.20
Fairfield, Ala. T2				5.20
Gary, Ind. U5	4.325	4.225	4.275	
Huntington, W. Va. W7				5.20
Indiana Harbor, Ind. I-2	4.325	4.225	4.275	
Johnstown, Pa. B2				(16) 5.20
Lackawanna, N.Y. B2	4.325	4.225	...	5.20
Minnequa, Colo. C10	4.325	4.125	...	5.70
Steelton, Pa. B2	4.325	4.225		
Williamsport, Pa. S10				5.20

TIE PLATES	
Fairfield, Ala. T2	5.125
Gary, Ind. U5	5.125
Ind. Harbor, Ind. I-2	5.125
Lackawanna, N.Y. B2	5.125
Minnequa, Colo. C10	5.125
Pittsburg, Calif. C11	5.275
Seattle, Wash. B1	5.275
Steelton, Pa. B2	5.125
Torrance, Calif. C11	5.275

TRACK BOLTS (20) Treated	
Kansas City, Mo. S8	11.00
Lebanon, Pa. B2	11.00
Minnequa, Colo. C10	11.00
Pittsburgh, Calif. P14	11.00

JOINT BARS	
Bessemer, Pa. U5	5.275
Fairfield, Ala. T2	5.275
Ind. Harbor, Ind. I-2	5.275
Joliet, Ill. U5	5.275
Lackawanna, N.Y. B2	5.275
Minnequa, Colo. C10	5.275
Steelton, Pa. B2	5.275

AXLES	
Ind. Harbor, Ind. S13	6.50
Johnstown, Pa. B2	6.50

STANDARD TRACK SPIKES	
Ind. Harbor, Ind. I-2, Y1	7.05
Kansas City, Mo. S8	7.30
Lebanon, Pa. B2	7.05
Minnequa, Colo. C10	7.05
Pittsburgh, Pa.	7.05
Seattle, Wash. B1	7.30
So. Chicago, Ill. R2	7.05
Struthers, O. Y1	7.05
Youngstown, O. R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural, 7/8-in. larger	5.50c
⅞-in. under	26.5 off

WASHERS, WROUGHT

F.o.b. shipping point to jobbers, 2.50

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ¾-in.	5
⅞-in. and larger	6
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	20
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	25

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	58
H.P. Hex, regular & heavy:	
¾" and smaller	57
⅞" to 1½", inclusive	60
1⅝" to 1", inclusive	62
1⅛" and larger	58
C.P. Hex, regular heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
¾" and smaller	40
⅞" to 1", inclusive	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller	34
¼-in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	39 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged, per cent off list)

6 in. or shorter:	
⅝-in. & smaller	25
¾ in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾ in. through 1 in.	5

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge Iron:	
98.5% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y.	11.25
Electrolytic Iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99% Fe)	36.50
Unannealed (99% Fe), minus 325 mesh	43.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots	28.00
Brass, 20-ton lots	29.00-39.50
Bronze, 10-ton lots	31.00-60.00
Copper:	
Electrolytic	41.25
Reduced	43.25
Lead	21.75
Magnesium	71.00-85.00
Manganese:	
Minus 35 mesh	52.00
Minus 100 mesh	57.00
Minus 200 mesh	62.00
Nickel, unannealed	89.50
Nickel Silver, 5-ton lots	42.00
Silicon	38.50
Solder	8.50†
Stainless Steel, 302	91.00
Tin	84.00†
Zinc, 10-ton lots	17.00-22.00
Tungsten	Dollars
Melting grade, 99%	
65 to 200 mesh	
200 mesh and over	4.55
Less than 1 ton lots	5.00
Chromium, electrolytic, 99%	2.40

†Plus cost of metal.

Footnotes

(1) Chicago base.
(2) Angles, flats, hand Merchant.
(4) Reinforcing:
(a) 1¼" to 1 7/16", 1 3/8" to 1 1/2", 1 5/16" & 1 1/4", 1 1/8" to 7/8", 3/4" to 5/16", 1/4".
(6) Chicago or Birm. base.
(7) To jobbers, mill basis.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.2c for 17 Ga. & heavier.
(14) Gage 0.143" to 0.240" in.; for gage 0.142 and lighter, 5c adv.
(15) 5/8" and thinner.
(16) ⅜ in. and under.
(17) Flats only, 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for unlisted.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 26 Ga. 30" wide.
(24) Bodnet 0 Dec. thicker than 16 Ga.
(25) Bar mill basis.
(26) Reinforcing mill lengths, to fabricators, to consumers, etc.
(27) Bar mill sizes.
(28) Reinforced.
(29) Youngstown base.
(30) Sheared; add 0.25c for universal mill.
(32) Bil. per square edge.
(33) To jobbers, deduct 20c.
(34) 9 in. for cut lengths.
(35) 12" and narrower.
(36) 24" and narrower.
(37) 15 gage & lighter 60" & narrower.
(38) 14 gage & lighter 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.022", 0.025" and heavier, 0.2c higher.
(41) 9 in. for cut lengths.
(45) 6.7 gage.
(46) If pref., add 2 cds. for T post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	33.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. 1-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. 1-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.33-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20	4.25	1.6	12.25	....	4.055
18.25	4.25	1	4.75	....	2.340
18	4	2	9	....	2.565-2.695
18	4	2	....	....	1.820
18	4	1	....	....	1.580-1.660
13.5	4	3	....	....	1.875
6.4	4.5	1.9	....	5	1.065
6	4	3	....	6	1.300
2	1.4	1.2	....	....	0.495
1.5	4	1	....	8.5	0.895

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON, Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward, Ala. W13	52.38	52.88	....	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	....
Boston, deld.	66.63	67.13	67.63	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse, N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary, Ind. U5	56.00	....	56.50	....
Indiana Harbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	58.17
Muskegon, Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron, O., deld. from Cleve.	58.24	58.74	58.74	58.74
Lorain, O. N8	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	58.00	58.50	59.00	58.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Philadelphia, deld.	60.25	61.25	61.75	62.25
Birdsboro, Pa. B10	58.00	58.50	....	....
Steelton, Pa. B2	58.00	58.50	59.00	58.50
Swedeland, Pa. A3	58.00	58.50	59.00	58.50
Troy, N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	....
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld.	57.37	57.87	57.87	....
McKees Rocks, deld.	57.04	57.54	57.54	....
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	57.66	58.16	58.16	....
Verona, Trafford, deld.	58.19	58.69	58.69	....
Brackenridge, deld.	58.45	58.95	58.95	....
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....
Monessen, Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	59.50	63.00	63.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
Granite City, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
LoneStar, Texas L6	52.00	52.50*	52.50	....
Minnequa, Colo. C10	58.00	58.00	58.00	....
Rockwood, Tenn. T3	....	....	56.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos., southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$67.00
Buffalo H1	68.25

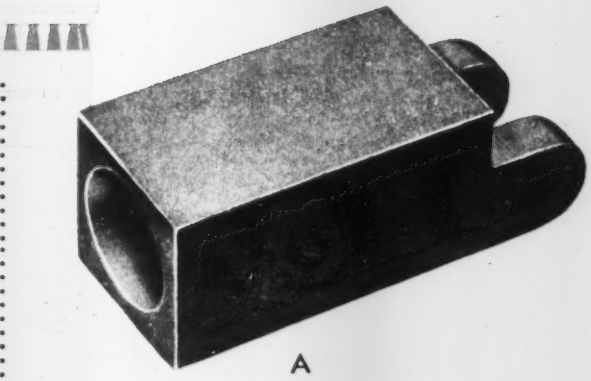
ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.04% max P)

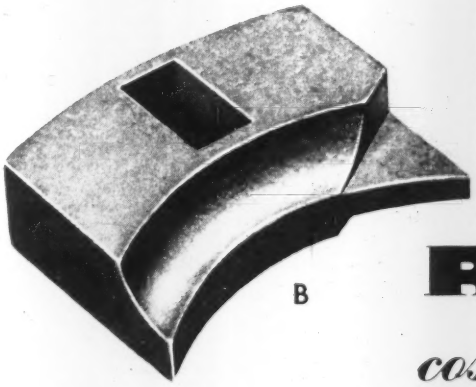
Niagara Falls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry., freight allowed K2	95.50
Keokuk, OH & Fdry. 12½ lb pigiets, 16% Si, frt. allowed K2	98.50
Wenatchee, Wash. OH & Fdry, freight allowed K2	95.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	64.00
Philadelphia, deld.	67.55
Troy, N.Y. R2	64.00



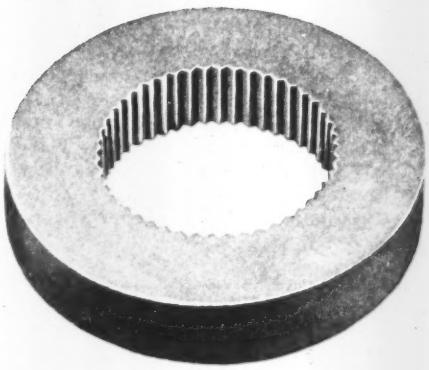
A



B

REDUCE

costly machining time and extend product life



C

with Crucible ACCUMET Precision Investment Castings

Where parts are intricate or machining difficult, substantial savings can be made by using Crucible Accumet Precision Investment Castings.

The Type 303 Stainless castings shown above (A & B), for example, eliminated practically all expensive machining operations for a manufacturer of milk bottling machinery.

In many cases life of component parts can be greatly extended by using castings of high alloy grades impractical to machine. The ring illustrated (casting C), used in a fine wire feed mill, is an investment casting made of Crucible *Rexalloy*, a non-ferrous cobalt-chromium-tungsten alloy steel providing exceptional wear and abrasion resistance.

Crucible engineers and metallurgists are available to help you solve design problems or lower production costs with Accumet Precision Investment Castings. Write now for further information.

CRUCIBLE first name in special purpose steels

53 *years of Fine steelmaking*

ACCUMET PRECISION CASTINGS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MAX-EL MACHINERY • SPECIAL PURPOSE STEELS

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Baltimore	6.20	7.64	7.75	7.00	...	6.86	8.17*	12.04	6.98	6.85	7.98
Birmingham	6.10	7.60	8.00‡	6.30	...	6.15	8.20	...	6.35	6.35	8.65
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37		7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.65	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.29	6.71	7.26	6.56	7.60	11.92	6.93	6.80	7.80
Erie, Pa.	6.19	7.13	9.01	6.54	...	6.28	7.70	...	6.56	6.50	7.79
Houston	7.15	7.60	9.40	7.45	...	7.45			7.35	7.20	8.55
Jersey City, N. J.	6.54	7.45	8.42	6.82	...	6.75	8.43*	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.00	7.35	7.20	9.25
Milwaukee	6.35	7.20	8.17	6.59	...	6.45	7.57	11.92	6.63	6.60	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65		6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43*	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43*		6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50		7.20	7.15	7.85
Philadelphia	6.53	7.55	8.41	7.02	8.80	6.87	8.19*	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	8.15	8.70	9.40	7.90	...	7.60	10.65	...	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	...	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	...	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40†	9.80	7.60	...	7.60	10.55*	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	...	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gages extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; ‡—500 to 9999 lb; §—1000 to 1999 lb; ¶—1000 lb and over; †—1500 lb to 3999; ¶ —under ½ in.

Warehouse Steel Buying Slackening

Distributors and consumers will order cautiously over balance of year to reduce yearend stocks. Some price cutting and freight absorption fail to jeopardize market structure

Philadelphia Some producers are reducing their minimum order quantities for warehouse from 5 tons per item to 3 tons. This is noted in bars, strip and sheets.

Pending full returns, leading distributors believe that November business will be on a parity with October on a day-to-day basis. Outlook for December is less promising in view of the likely slowing up of business generally around the yearend holidays.

Warehouse business in hot and cold-rolled sheets and in galvanized is slow. There is some price cutting, but not enough, at least so far, to jeopardize the market structure. Structurals are the tightest item with most warehouses.

New York Warehouses are absorbing freight and competition among distributors is sharpening as many consumers strive for low inventories at year-end. Where stocks are on the high side, prices are inclined to soften. Galvanized sheets, nails and pipe are in this category, notably buttweld pipe with 17½ points off list frequent. Imported carbon bars, standard structurals and nails are underselling warehouse. Mostly from Belgium, imported nails average better than 5000 kegs per week at eastern ports. Slow improvement in demand for nickel-chromium stainless is disappointing. Passing of nickel control through end-use under M-80 has not stimulated buying.

Cleveland Local distributors are encountering increasing competition for orders but volume is reported holding up well despite the fact individual orders are smaller. Some letdown in demand is expected beginning this week as the holiday season approaches.

Inventories are steadily improving but wide flange structurals and light plates are not too readily available. Bar supply is greatly improved and sheets are reported in comfortable position with receipts from the mills coming in steadily. Distributors are ordering from the mills cautiously, following a policy of inventory-watching currently in vogue among consumers.

Pittsburgh Competition is growing among warehouses as consumers

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.65	$4.75	$4.65	$4.90
Bar Size Angles	4.30	4.40	4.30	4.58
Structural Angles	4.30	4.40	4.30	4.58
I-Beams	4.30	4.40	4.30	4.58
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.26
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.55	4.65	4.55	4.82
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.68	4.75	4.73	5.00
Wire Rods, O-H, Cold Heading Quality No. 5	5.14	5.21	5.19	5.46
Channels	4.40	4.50	4.40	4.68
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅜ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

become inventory-conscious. Result is lower sales now with the possibility of improvement next quarter. Stocks of plates are nearing completion, but structural shapes continue tight. In certain lines, such as alloy bars and galvanized sheets, there are scattered signs of price cutting. Warehouses in outlying areas are reported absorbing freight to attract customers.

Seattle Warehouse steel turnover is spotty. Sustained demand is lacking. Consumers are postponing purchases until first quarter. Wide flange shapes are short but sheets and plates are in good supply.

Los Angeles Distributors' stocks are rising despite improvement in demand. Competition is keener. Several premium-priced sellers have closed their doors.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 154

Chicago Demand for reinforcing steel is expected to be at a substantial level in 1954, although it will be substantially below the volume this year. Building construction is being forecast as only moderately off. States of Illinois and Indiana have ambitious highway programs under preparation, the former earmarking $64 million for this purpose and the latter $28 million.

Los Angeles 1954-55 state budget calls for $267 million worth of highway construction.

Seattle Rolling mills are eating into backlogs as little new business is developing. Several sizable projects are up for early decision but bookings are slow and competition is increasingly keen.

Tin Plate . . .

Tin Plate Prices, Page 156

Washington Shipments of metal cans in September totaled 484,561 tons against 506,215 tons in August and 460,155 a year ago. Total for first nine months was 3,206,526 tons against 2,985,077 in the corresponding period last year, a rise of about 7 per cent.

New York U. S. Steel Products Division, U. S. Steel Corp., soon will start construction of a 168,000 square foot steel container plant on a 26.7 acre site in Camden county, New Jersey.

Annual capacity is scheduled to be 2,370,000 drums and 3,200,000 pails.

Pittsburgh First encouraging reports on tin plate sales since September are circulating. Market sources believe this year's seasonal slump is nearly past.

Sheetmakers Press For New Bookings

First quarter order books filling up more slowly than in recent past years with consumers displaying inventory caution. Pickup expected before yearend

Sheet and Strip Prices, Page 154 & 155

Boston Flat-rolled steel users are prepared to take full advantage of the toughest competitive selling situation confronting producers in nearly 15 years. The buyer's market in sheets and strip will be intensified early next year. Not only are premium prices disappearing, but consumers are holding out for lowest delivered prices based on freight absorption to meet most favorably located supplier.

For the most part this pressure is confined to carbon grades, but it is spreading to specialties, including stainless. With margins higher mills generally can absorb more freight on these more profitable items.

Sheet orders for January are upward and some narrow cold-rolled strip schedules are nearly filled for that month, but beyond, buying is cautious.

New York Sheet producers have substantial space open for January. However, some midwestern producers report their limited allotments for this area for that month have been absorbed.

Among the specialties, stainless steel appears to be moving the slowest of all. Most producers of stainless are in position to make shipments before the end of this year.

Philadelphia January sheet specifications are gradually building up. This applies not only to hot and cold-rolled but to galvanized sheets as well. The fact is, galvanized sheets are in tighter supply with one large mill than the two major items.

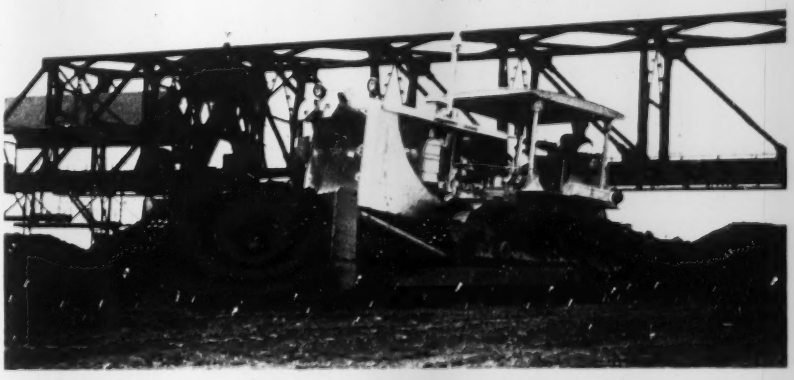
Demand for sheets generally remains spotty, with plenty of tonnage available through resellers for consumers willing to pay the warehouse premium.

Pittsburgh Sheetmakers expect orders from automakers to pick up strongly in January, with resultant tightening in supply. Currently most consumers are ordering less, holding off until yearend. Inventories are low, suggesting a hurried rush for sheet tonnage early next year.

Cleveland Sheetmakers are booked comfortably for remainder of this quarter but they have open spaces in first quarter schedules which are filling much more slowly than had been anticipated. Freight is being absorbed with competition for orders noticeably sharper.

Expectations are first quarter books will be pretty well filled by the time January rolls around since consumer inventories are reportedly pretty well depleted.

Chicago Acme Steel Co., effective Nov. 19, reduced its price on cold-rolled strip, 0.035-inch thick and heavier, by $5 per ton to make it uniform with lighter strip at 5.70c, Riverdale, Ill. Thompson Wire Co., with plant in Franklin Park, Ill., made a similar reduction. Both com-



Bulldozer Increases Ore Yard Capacity at Campbell Plant

Youngstown Sheet & Tube Co., Youngstown, increased capacty of the ore yard at its Campbell Works by utilizing a bulldozer. Formerly, ore could be piled only as high as the bottom of the bucket and cab on the ore bridge. Now, by using the bulldozer, ore can be pushed up to a level just under the lower beam of the bridge. Valleys are left in the pile so the ore bridge can travel the entire ore yard

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panies are now fully competitive with other district stripmakers at 5.70c for all gages.

Alloy Steel . . .

Pittsburgh—As a result of recent increase in the cost of cobalt, Allegheny Ludlum Steel Corp. is advancing prices on cobalt-bearing high-temperature alloys. Effective Dec. 1, the high-temperature material marketed as S-816 will be increased by 25 cents per pound, and material marketed as S-590 will be increased by 12 cents per pound.

Two other high-temperature materials, M-252 and Waspaloy, which the company produces under license agreement, will be increased by 7.5 cents and 9 cents per pound, respectively.

Steel Bars . . .

Bar Prices, Page 154

Philadelphia—Although cold drawers still have various sizes and specifications available for shipment before yearend, hot carbon bar producers say schedules are well filled for December. At least two report January capacity is now pretty well taken up. Sellers anticipate a good first quarter, some even thinking it will surpass the current quarter. No improvement is noted in alloy bars, either hot or cold-finished.

Boston—Demand for carbon bars may well be higher in first quarter but orders are slow to indicate this trend. Flurry in late yearend orders for December points to needs for inventory fill-ins. While under peak, partly due to military cutbacks, bar consumption continues substantial.

Bar tonnage could pick up materially in the next three months without straining supply. More volume will be available from Buffalo district converters of cold-finished, and Fairless, Pa., including a broader range of sizes from the latter point.

Pittsburgh—Long range sales prospects for steel bars are promising, but current purchases are for limited tonnage. Competition is growing for spot orders. Most consumers are content to rest with present inventory levels.

U. S. Steel Corp. issued additions to its product catalog Nov. 13 consisting of revised sections in square edge flats, rounds, deformed rounds and special joint bars. Changes are limited.

Cleveland—While first quarter bar orders continue to come to the mills at a much slower pace than in recent years, a substantial tonnage

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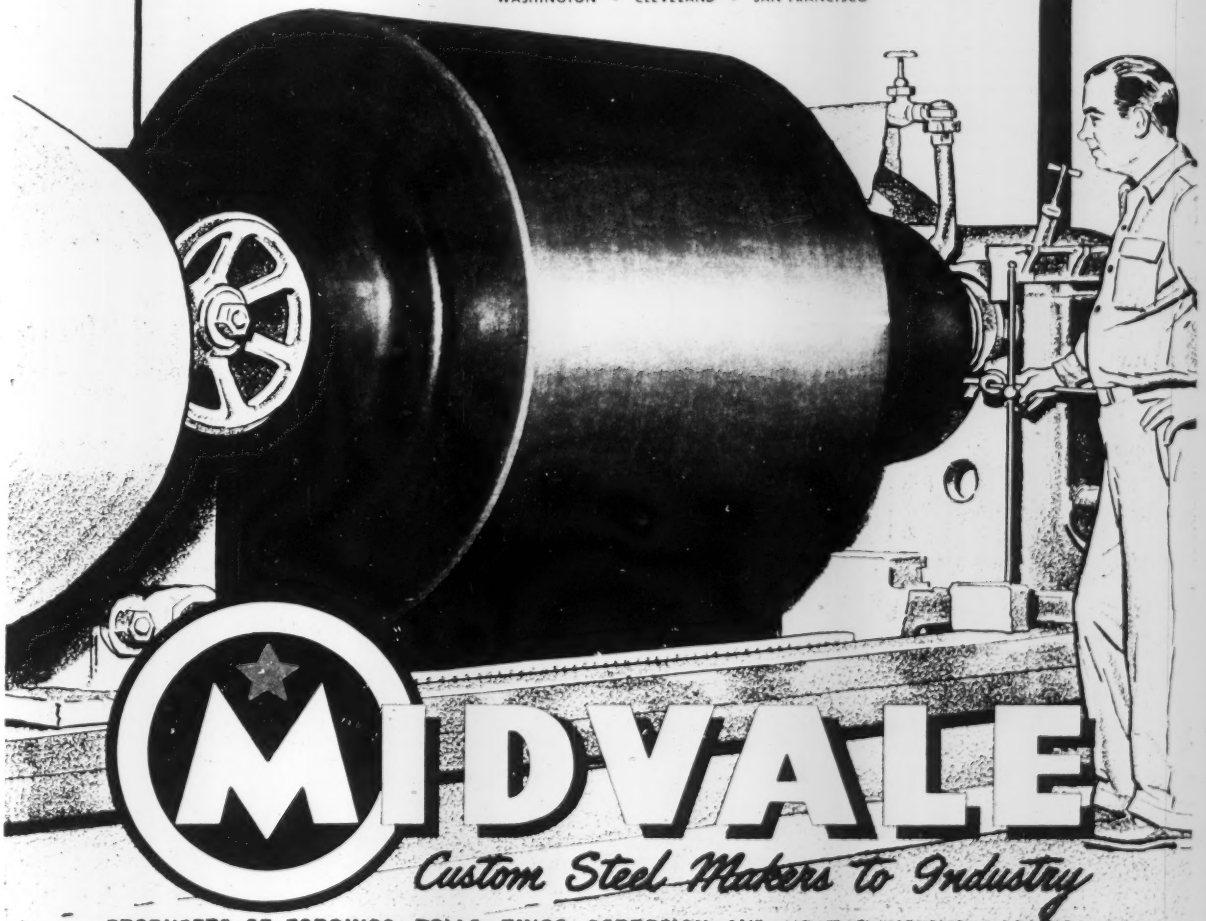

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is on books for the period and sellers anticipate the tempo of demand will step up as the yearend approaches.

Tubular Goods . . .

Tubular Goods Prices, Page 157

Pittsburgh Sharp competition and reduction of forward buying depressed welded tubing sales. Some recovery is expected early next year when such consumers as the automotive industry replenish inventories. Seamless tubing sales for oil country use continue strong.

Washington New petitions under consideration by the Interstate Commerce Commission seek lower freight rates on pipe and tubing from Minnequa, Colo., to Texas gulf points and on iron and steel castings from Birmingham, to Toledo, O.

Boston Distributors of seamless mechanical tubing are turning down part of January tonnage. Boiler and pressure tubing, seamless and electric welded, are also slack. Of tubular products, seamles pipe in the 5 and 10-inch size range, leads demand.

Pipe sellers are operating largely on inventories, notably buttweld, with prices softening at secondary levels on that grade.

Los Angeles With oil country tubular goods in good supply, California oil well drillers have drilled 5 per cent more wells in 9 months this year compared with the like period last year.

Seattle The cast iron pipe market is quiet. Little interest is expected for 30 days. Dealers are selling small lots from inventory.

Semifinished Steel . . .

Semifinished Prices, Page 154

Pittsburgh Strike by railroad unions closed Jones & Laughlin Steel Corp.'s Aliquippa Works last week. Some 15,000 workers were idled. Coke ovens were closed and five blast furnaces banked. As a result, Pittsburgh District steel operations dropped to 77.5 per cent of capacity last week, lowest this year.

Los Angeles District mills reduced steel production over the Thanksgiving holiday.

San Francisco Steel ingot production in this district is below 40 per cent of capacity. One company it is reported will furlough 900 persons before the first of the year.

Open-hearth operations are not too indicative of over-all finished steel operations. One big producer "imports" sheet coils from another mill for processing through its own finishing mills.

Excess ingot supply is reflected in an announcement by Kaiser Steel Corp. in Oakland that it has lowered prices on its carbon steel blooms, billets and slabs by $11 a ton.

Plates . . .

Plate Prices, Page 154

Chicago Plates are one product on which one important mill here is over-booked for the remainder of this year and January. This is despite the fact its platemaking facilities will be operated at full capacity. All customers have not specified against their quotas for January.

Boston Plate bookings for January include fairly substantial volume in light gage, wide stock, but first quarter orders are generally slow. Ability of producers to ship closer to promised dates has eased the tendency toward forward buying. Other factors are yearend inventory adjustments and lower backlogs with most fabricating shops.

Clad plate shipments have improved to 8-10 weeks, also heads and flanged work.

New York Plate specifications are moderately active, with some stepping up in January tonnage. There is still open space at most mills, and particularly at premium price mills. Certain of these latter have had little in the way of backlogs for some time. Through error, Jones & Laughlin Steel Corp.'s reduction in gage and width extras were noted last week as applying to a top limit of 3/16 inch. This should have been 3/8 inch.

Philadelphia Except for two mills, plate producers are covered for the remainder of this year and for the greater part of January. Over-all trend, however, is still sluggish. Tank and boiler shops continue to cut into inventories, although buying fairly freely of the lighter gages.

Pittsburgh Consumers are cutting inventories with plate supply looser than in third quarter. Truckmakers and agricultural equipment producers have trimmed purchases. Producers here expect sales to regain their strength in January.

Los Angeles Pressure for plates is rising and that product is in tightest supply of any steel product. Plate books of Columbia-Geneva Steel Division, U. S. Steel Corp., with reduced allocations to account for fourth quarter carryover, are open for first quarter.

Steel Shipments Gain In First 9 Months

Each of the 20 consuming classifications received more tonnage than in like 1952 period. Gains range from 3 per cent for agriculture to 71 per cent for appliances

New York – Shipments of steel products in September were 6,400,757 net tons, 141,000 less than a year earlier, reports the American Iron & Steel Institute.

In the first 9 months shipments totaled 61,848,324 tons, 14,611,000 tons more than in the like 1952 period and exceeding the previous record, set in the first 9 months of 1951, by over 2.9 million tons.

Of the 141,000-ton decrease in September compared with a year ago, nearly 132,000 tons were accounted for by a drop in direct mill shipments for export. In the first 9 months this year mill export shipments amounted to nearly 1,982,000 tons, off 308,000, or 13 per cent, from the corresponding period of 1952.

Total domestic shipments in September were 6,226,259 tons, decrease of less than 10,000 tons from a year earlier. The 20 industrial consuming classifications were equally divided between the number of plus and minus signs in comparison with September, 1952. Largest increases were for construction, automotive, railroads and appliances, while cuts were chiefly for warehouses, shipbuilding, agriculture and containers.

In the first 9 months each of the 20 classifications received more steel than in the like 1952 period. Wide differences were shown in the extent of the increases, varying from 3 per cent for agriculture to 71 per cent for appliances.

Among other large percentage increases were those to automobiles, electrical equipment, and military equipment. Among increases, although not as much percentagewise as the foregoing, were construction, railroads and their equipment builders, machinery and containers.

Warehouses obtained over 11,380,000 net tons in the first 9 months, 22 per cent more than a year earlier. This was 19 per cent of the total domestic shipments, and was only slightly less than the 19.8 per cent shipped to the automotive industry.

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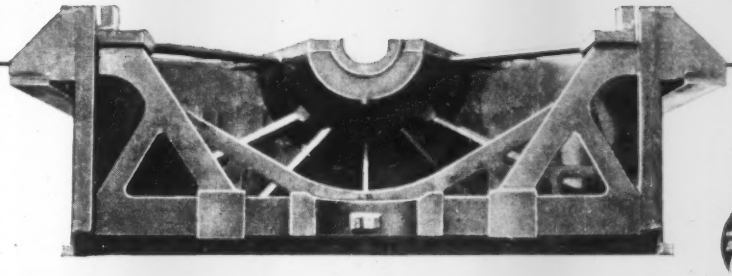

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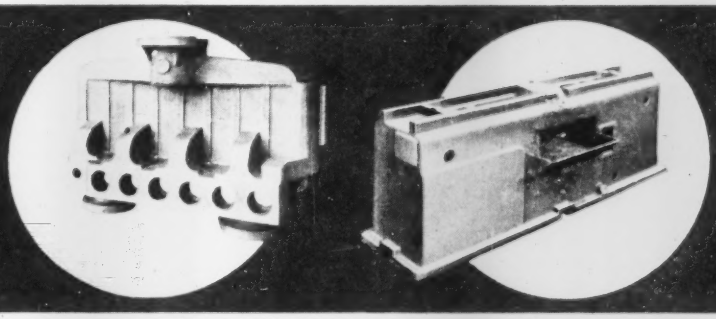

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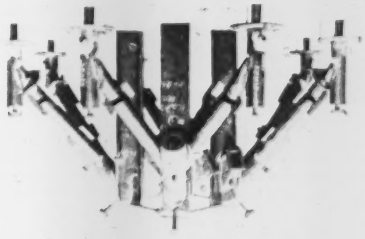

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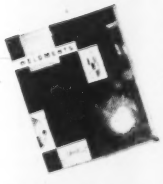

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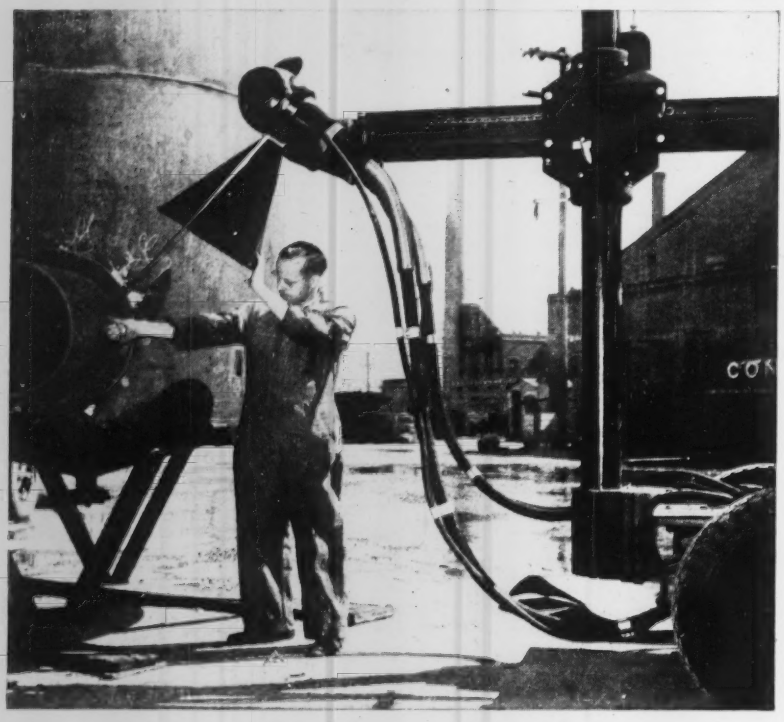

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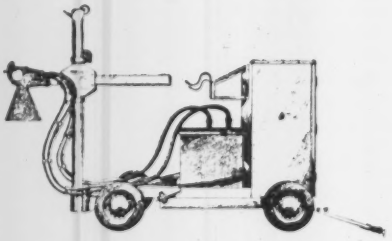

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Structural Shapes . . .

Structural Shape Prices, Page 154

Philadelphia—Structural fabricators report steel inventories as being in reasonably good balance, except for wide flange sections, and in this item they see no chance of rounding out stocks in the near future.

Shops are cutting into their order backlogs to some extent, as seasonal influences retard new business.

Pittsburgh—Certificates of necessity totaling $1,540,000 have been issued the United States Steel Corp. by the Office of Defense Mobilization for expansion of its wide flanged beam structural shape mill at Munhall, Pa.

Boston—Suppliers of standard structural shapes will be caught up with schedules on most sizes early next year, but wide flange structurals will be in short supply for some months. Meanwhile, more imported structural tonnage is offered at prices below domestic steel, but not in the full size ranges.

Estimating for fabricated work is heavier, notably for bridges. While considerable volume will go under contract this winter, shop fabricating will be mostly in second or third quarters.

New York—Structural steel activity is beginning to reflect more noticeably the adverse influences of the advancing season. Bridge work is beginning to level off, although there is still considerable tonnage active. Awards generally are less numerous.

Los Angeles—The $8 million Great Western Exposition Center has started with construction of the first unit valued at $396,000. Demand for structural shapes is sustained.

Seattle—Fabricators report a fair run of small tonnages in schools, commercial and industrial projects. Largest project pending involves 3500 tons for gates and appurtenances for The Dalles dam, Columbia river, bids in.

Wire . . .

Wire Prices, Page 156

New York—Mild increase in wire orders for prompt delivery indicates consumer inventories have been worked down to balance production with some shortages in varying sizes. Buying for first quarter is slow, numerous users confining foreward orders to January. Valve spring and automotive volume extends well into first quarter. Piston ring steel and a few other specialties, high carbon, are active with production schedules more extended than for most grades. Raritan arsenal closes Dec. 4 on 100

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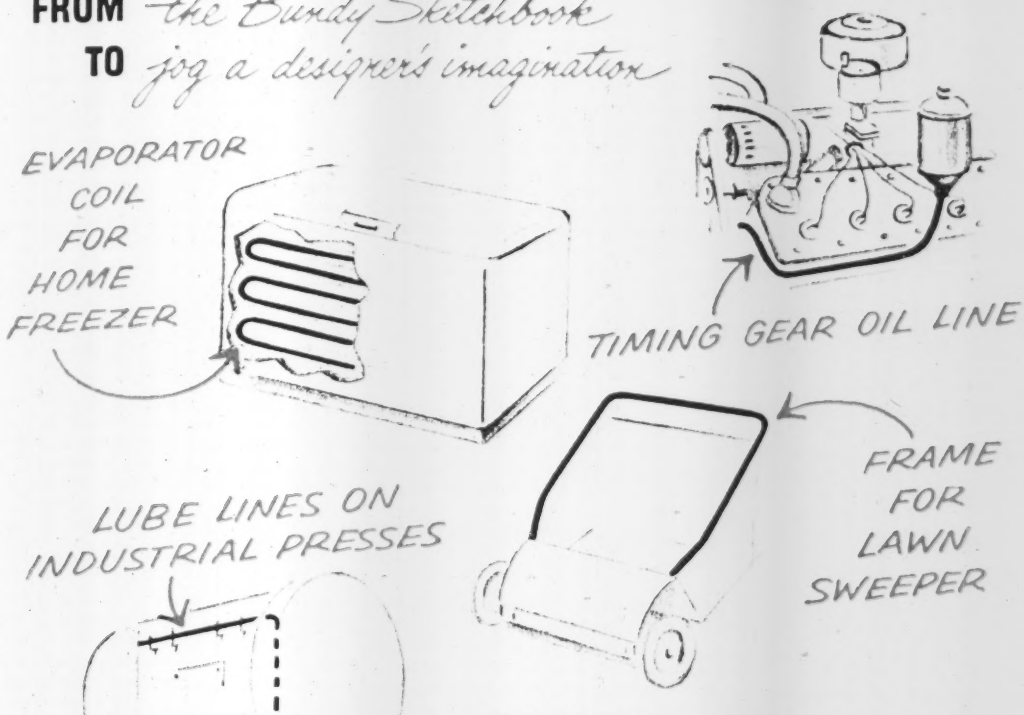

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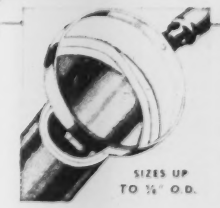

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Nickend 2	E8015
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Boston—Wire orders for first quarter are sluggish, limited to January mostly with consumers holding off beyond that month. While inventories have been worked down by most users, forward buying is slow. Screw manufacturers have not placed normal volume for the January-March period yet, but the total for next quarter may be higher than in the fourth quarter.

Buying by manufacturers of wire forms and wire fabricated goods holds up better than average, notably bright wire.

Trenton works of American Steel & Wire Division, U. S. Steel Corp., will draw approximately 5000 tons of wire for the Philadelphia-Gloucester suspension bridge over the Delaware river.

Chicago—Consumers of manufacturers wire products have been slow in placing orders and are giving mills less lead-time but they continue optimistic on future needs. Merchant products are off, except nail volume which is comparable with a year ago.

Pig Iron . . .

Pig Iron Prices, Page 158

Cleveland—Merchant iron sellers are seeking new business aggressively with foundry operations spotty. Indications are there will be little change in market conditions over remainder of the year. Melters are expected to order only against needs in sight, paying particular attention to holding down inventories.

Boston—Available pig iron tonnage is in excess of demand in foundry grades and supplemented by more imported basic volume at lower prices; 9000 tons of foreign basic sold to a central Massachusetts consumer under $50 per ton delivered. Basic is also in ample supply from the Troy, N. Y. furnace and Everett. While users of that grade are disposed to build up reserves slightly, foundry shops will end 1953 with low inventories and small backlogs.

New York—Pig iron business shows no improvement, but is holding its own. Sellers look for little change over remainder of this year. Operations at district iron foundries are sluggish. In few cases is there any particular pressure for iron. Most consumers are aiming to keep inventories as low as possible until after turn of the year.

Philadelphia—Pig iron sellers look for further decline in demand during December. Already they are receiv-

ing reports from foundries of their intention of closing down for the Christmas holiday week.

The Barium interests have placed a sintering plant of about 500 tons daily capacity into experimental operation at Chester, Pa., adjacent to their blast furnace which has been closed down for some time.

Birmingham—Pig iron production has been further curtailed by closing down of one of Republic Steel Corp.'s two blast furnaces at Gadsden, Ala.

Los Angeles—Foundry activity has quickened. Melters' pouring rates were 10 to 15 per cent higher in October than in September. Pig iron is plentiful.

Seattle—Foundries report domestic pig iron is in good supply but averages $68 per ton delivered here compared with $60 for imported Australian iron, some of which is enroute here and for which additional orders will be placed by local consumers.

Iron Ore . . .

Iron Ore Prices, Page 177

Cleveland—With the Great Lakes iron ore shipping season nearing a close season shipments in excess of 96 million tons, a new record, are assured. The ore carriers in the week ended Nov. 23 brought down 1,215,874 gross tons, bringing the season's shipments to date to 95,415,505 tons, reports the Lake Superior Iron Ore Association.

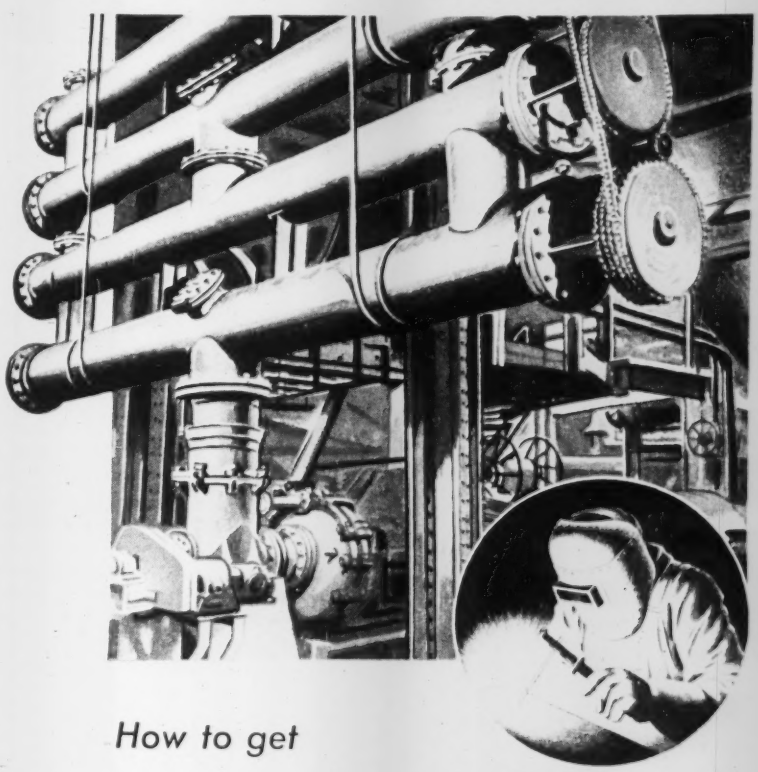
Total stocks of lake ore on Lake Erie docks and at furnaces on Nov. 1 totaled 55,699,844 gross tons. This was an increase compared with 51,766,772 on Oct. 1, and a sharp gain compared with the 47,839,049 tons on hand on Nov. 1 a year ago.

Consumption of lake ore in October amounted to 8,141,698 gross tons. This compares with 7,699,110 in September and with 8,038,324 tons in October, 1952. Cumulative consumption in the first 10 months this year was 80,354,241 gross tons, comparing with 62,304,061 in the like period of 1952.

On Nov. 1 there were 18 idle blast furnaces in the U. S. out of a total of 173. In Canada, idle furnaces numbered 4 out of a total of 9. A year ago 6 furnaces were idle in the U. S. and 1 in Canada.

Washington—Proposed cut by the Chesapeake & Ohio railroad in its rates for hauling imported iron ore from Newport News and Norfolk, Va., to the Great Lakes region has been rejected by the Interstate Commerce Commission.

The road sought to reduce its



How to get
corrosion-resistant ***continuity***
when welding stainless clad steels

When you weld clad materials you are welding dissimilar metals. The weld metal will be a combination of the two base materials plus the filler metal of the electrode.

Proper electrode selection is an essential step in developing the required corrosion resistance in a weld. Just as important as the selection of electrodes in clad welding are correctly designed joints and proper heat treatments.

Arcos long experience in welding stainless and the clad materials can guide you in the selection of the proper electrode and welding procedure necessary for successful fabrication. Take advantage of the rigidly controlled qualities of Arcos electrodes to get consistently sound welds at a low overall cost.

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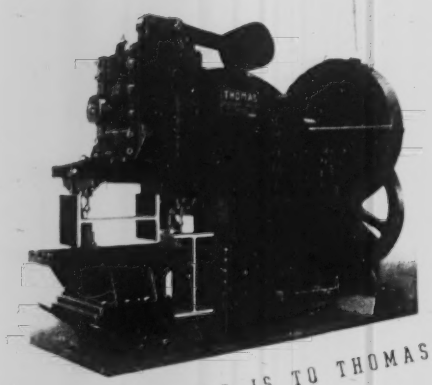
BEAM PUNCHING
without tool change



THE newly designed Thomas Beam Punches are built in sizes to handle beams up to 12"-18"-24"-30" and 36", web and flange punching, with a single tool set-up. Any of the five sizes may be used with or without a Thomas spacing Table, depending on production needs.

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PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

51

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TRADE MARK REGISTERED

For Low Overhead

The dripless, waste-less quality inherent in NON-FLUID OIL eliminates oil showers from overhead machinery—of all kinds including cranes and motors. Consequently, spatter-free NON-FLUID OIL reduces cleaning time, lessens fire hazards, and lowers oil and application costs.

NON-FLUID OIL is a specialty lubricant . . . sold only on a performance basis. It is produced in special grades for a specific lubrication job . . . every grade tested under actual load conditions to assure its superiority over ordinary oils and greases.

For a convincing demonstration send for instructive bulletin and free testing sample of NON-FLUID OIL stating where it will be used.

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NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

rates from $3.51 to $2.91 per long ton for the haul from the Virginia ports to the Toledo dock area. It claimed the reduction would permit it to compete with railroads operating out of the port of Baltimore. These latter charge $2.91 per long ton from Baltimore to Cleveland.

The 60-cent disparity between rates from Virginia ports and Baltimore stems from rate reductions on iron ore in October, 1950. The Baltimore to Cleveland rate at that time was reduced from $4.37 to $2.91 per long ton, while that from Virginia ports to Toledo was cut from $4.83 to $3.51.

Scrap . . .

Scrap Prices, Page 180

Washington—Stocks of ferrous materials (scrap and pig iron) held by consumers totaled 8,525,000 gross tons on Sept. 30, reports the Bureau of Mines.

Purchased scrap stocks, 4,818,000 tons, increased to the third highest month-end total for the year, while home scrap stocks, 1,463,000 tons, reached a new high for the year and were only 162,000 tons less than the record 1,625,000 tons held on July 31, 1949.

Pig iron stocks held by consumers totaled 2,244,000 tons and established a new record inventory.

Consumption of ferrous material in September was down from the preceding month, due largely to work stoppages, curtailments and discontinuance of operations at various plants.

Purchased scrap consumption amounted to 2,394,000 tons; home scrap 3,002,000; pig iron, 5,379,000 tons. Total melt was 10,775,000 tons, decrease of 504,000 tons from August.

Washington—Up to Nov. 18, only 52,938 net tons of all grades of iron and steel scrap were licensed for export from the continental United States during fourth quarter this year, reports the Bureau of Foreign Commerce, U. S. Commerce Department.

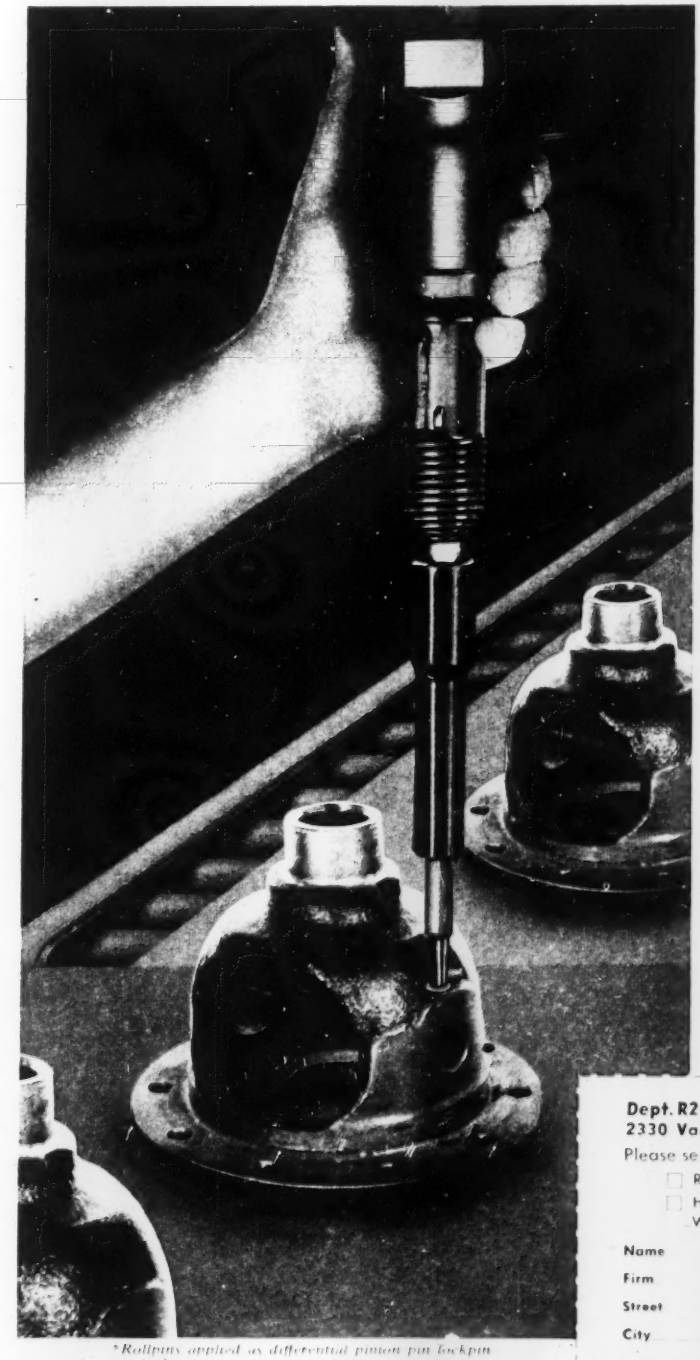
Under the new open-end licensing policy recently effected for the fourth quarter only, 50,398 net tons were approved for export to Japan and 2540 tons to Mexico. The Mexican tonnage is in addition to the regular quota of 50,255 net tons established earlier for that country for the final quarter this year.

No. 2 heavy melting scrap and No. 2 bundles accounted for the major portion of the total tonnage.

Boston—No. 2 heavy melting and

Ford Cuts Assembly Costs using

ROLLPIN
TRADE MARK



*Rollpins applied as differential pinion pin lockpin on the Ford Motor Mound Road Plant assembly line.

Rollpin is the slotted tubular steel spring pin with chamfered ends. Simply drive it into holes drilled to normal production tolerances. It compresses as driven—and its spring action locks it in place regardless of impact loading, stress reversals or vibration.

Rollpin assembly eliminates extra operations and parts. There is no precision drilling, threading, peening—and no cotter pins or other locking devices. Cost savings as great as 90% result—depending upon the type of fastener replaced and the assembly method now in use. Our illustration is an air gun set-up that installs Rollpin at the rate of 8 units a minute on the Ford assembly line.*

Other insertion procedures range from simply driving Rollpin with a hammer to more intricate hopper-fed methods. Independent time studies have shown installed costs of Rollpin at 9% of that for a dowel pin and *less than* 5% of the installed cost of a taper pin.

Mail our coupon for information on how Rollpin will do your fastening faster and cheaper.

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Please send the following free fastening information:

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a SQUARE

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Flat or corrugated Hendrick Perforated Metal is available in any desired shape and size of perforations in high carbon steel and other commercially rolled metals. Decks can be changed fast and efficiently—cutting time and labor costs. For more details write for information.

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THE CHAMPION RIVET CO.
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bundles have lost some earlier buoyancy, but light steel, borings and turnings, maintain a firm tone. Trend upward in prices appears to have slowed temporarily due to lack of consumer pressure. Several will not buy beyond $1 to $5 freight area.

Cast buying is spasmodic with prices unchanged and soft. Low cast prices in relation to pig iron costs result in some increase in scrap melt where gray iron casting specifications are not too rigid.

New York—Brokers' buying prices are unchanged despite little consumer buying and a weak tone to the market generally. Strike at local scrap yards has been settled with incoming and outgoing shipments now back to more normal level.

Philadelphia—The scrap market is easy, although no change is noted in the major steel grades, apart from a reduction by the Conshohocken, Pa., consumer of $1 per ton in its truck shipments to levels of $31 delivered for No. 1 heavy melting and $28 for No. 2. Mixed borings and turnings are in slow demand locally, but in view of buying from outside this district, prices are higher at $24.50. Rail crops are stronger at $48 to $50 delivered. Otherwise, prices are soft, this applying to cast as well as most steel grades.

Pittsburgh—A small purchase of open-hearth scrap by an area mill was responsible for depressing quotations for No. 1 and No. 2 heavy melting scrap and No. 2 bundles. Scrap activity is light, and increased buying could bolster prices, some sources believe.

Cleveland—Easier tone prevails in the scrap market, especially in the steel grades, with buying at a virtual standstill. Some foundry scrap is moving, however, and dealers are encouraged to anticipate still better movement in this area of the market as the automotive industry swings into full-scale production on 1954 models.

Prices on steelmaking grades are off about $1 from a week ago, chiefly reflecting sales in nearby districts at lower levels. Mills in this area are not taking shipments at present on old contracts, and only one large interest in the Valley is buying currently, and this mill on a limited scale.

Detroit—Scrap prices are unchanged. For all practical purposes traders are marking time until automotive lists are out of the way. Continued downtrend in the market is expected.

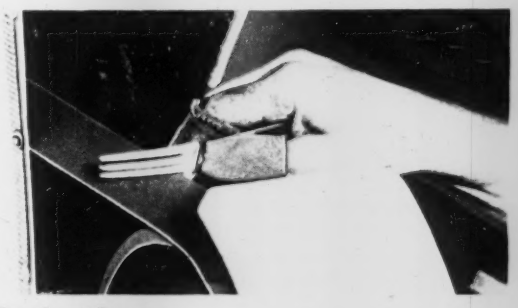
Chicago—Insofar as consumer buy-

(*Please turn to page* 178)

How would you SOLVE IT?

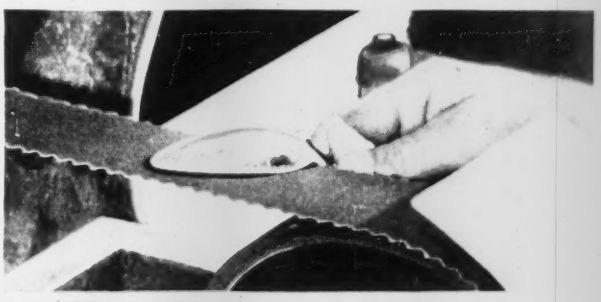
1. Production Problem:

To cut unit costs of trimming and polishing sterling silver forks and spoons. Towle Silversmiths, of Newburyport, Mass., wanted a modern, low-cost method which could equal the fine results of patient, old-time craftsmanship.



2. Solution:

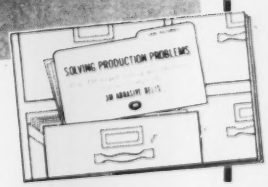
A 3M Representative suggested that this manufacturer switch to 3M Belts, using Grit #150 Three-M-ite Resinite belts for shaping fork tines, the "Scallop-Edge" Belt on the bowl of the spoon, and 3M Cork Belts for polishing forks and spoons.



3. Results:

An immediate saving of 50% on the tining cost, with better quality finishes. The firm found they could finish as many as 30 lots of sterling silverware with one belt! A 3M Representative can help you solve your grinding problems, too. His services are available without cost or obligation.

3M ABRASIVES



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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton $38 Palmerton, Pa.; $37 Clairton and Duquesne, Pa.
(16 to 19% Mn) $34 per ton, Palmerton, Pa.; $35 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala., and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low Carbon Ferromanganese, Regular Grade: (Mn 85-90%) Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn; carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices. 1c for max 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C, max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium Carbon Ferromanganese: (Mn 80-85, C 1.5% max.) Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%) Contract, lump, bulk, 1.50% C grade, 18.20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti, less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium Carbon: (Ti 17-21%, C 2-4.5%) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High Carbon Ferrochrome: Contract, c.l. lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28.32%, C 1.25% max) Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c, less ton lot, 20.4c, delivered; spot, add 0.25c.

Low Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 1" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.50c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant, freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr, 36-39%, Si 26-29%, Al 7-9%, C 0.05% max) 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D, packed, max 0.50% C, carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 4c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 56c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c, ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max) Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max) Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max) Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-11% B) 5.4c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%) Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%) Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn) Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquetts: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $1.10 per lb of contained W; 2000 lb W to 10,000 lb W, $1.20; less than 2000 lb W, $1.32, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max) Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%) Carload packed, 1" x D, 45c per lb of alloy; ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx) Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

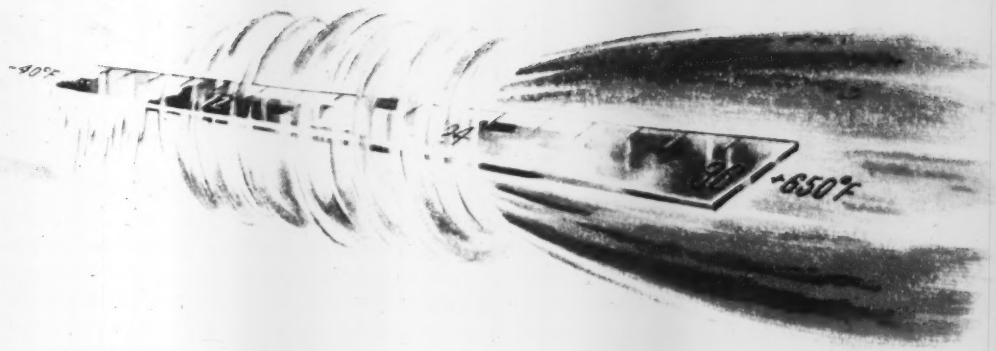
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%) C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $60 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 to all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.



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The know-how and facilities the Jet Division has built up to solve problems for jet-engine builders can be adapted to *your* product . . . present or planned.

Tell us what you have in mind . . . we'll gladly work out the details with your designers and engineers.

JET DIVISION

Thompson Products, Inc.

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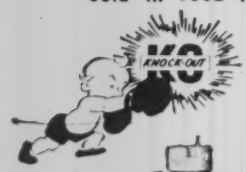
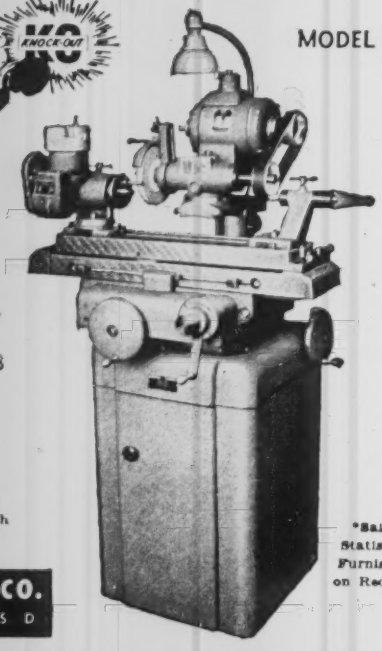


MODEL B860



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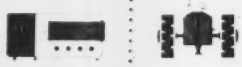

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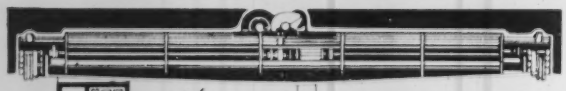

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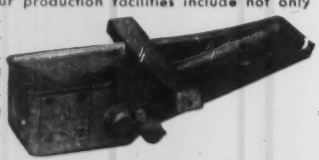

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LA BELLE CUT NAILS

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematite (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 65%, WO_3, good commercial quality	$39-$40
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.18-$1.21 per long ton unit c.i.f. U. S. ports, duty for buyers' account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African		
48%	2.8:1	$40.00-$42.00
48%	3:1	44.00-46.00
48%	no ratio	32.00-34.00
South African Transvaal		
44%	no ratio	$27.00-$28.00
48%	no ratio	34.00-35.00
Brazilian		
44%	2.5:1 lump	nom. $32
Domestic		
(Rail nearest seller)		
48%	3:1	$39.00

Molybdenum

Sulphide concentrate, per lb. Mb content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vanadalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $123; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F. Massillon, O. $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83, Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Rock, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettaville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, producing point

Phenol, 90 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
Inches		
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.56

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Scrap . . .

(*Concluded from page 172*)

Pittsburg is concerned, the scrap market has ignored the report of certain dealer grades selling off from $1 to $3 in Pittsburgh. Brokers on the other hand are being more cautious and decline to pay premiums of $1 to $2 a ton for material to fill old orders as has been the practice for a couple of weeks.

Because of heavy inventories and a slightly lower steelmaking rate, mills can limit new buying as they choose. The market here will be established when an important mill contracts for its December scrap intake.

Birmingham Scrap remains pretty much of an unknown quantity in this district. Not much melting steel is moving and that mostly out of the district. Cast is tight largely because little tonnage is being received locally.

San Francisco Steel scrap is moving at the slowest pace of the postwar period. The two major steel producers in the immediate area at the moment are working only about 40 per cent of their open hearths and a smaller company, Pacific States Steel Co., still is shut down by a labor dispute. The scrap market as a result is depressed, except for cast grades which continue in firm demand.

Seattle Cast iron scrap is not too plentiful but dealers are holding back in expectation of an active export demand. Electric furnace scrap is quoted $36 to $38. Foundries recently paid up to $35 for No. 1 cupola.

Larger buyers have filled their month's quotas. As a result scrap trading is slow. When December's requirements are covered, larger buyers expect a softer market tone in the absence of active exports.

Good grades of steel scrap are available in sufficient volume for local demands. Bundles continue definitely surplus. No. 2 bundles are quoted $19, and stove plate $29.

Canada . . .

Toronto, Ont. Production of primary iron and steel shapes in Canada in June totaled 419,633 net tons against 425,146 net tons in May and 410,335 tons in June, 1952.

Shipments for sale in June amounted to 287,707 net tons and compared with 287,400 tons in May and with 263,685 net tons in June last year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5500 tons, office building, Fulton National Bank, Atlanta, Ga., to Bethlehem Steel Co., Bethlehem, Pa.; Henry C. Beck Co., Atlanta, general contractor.

5000 tons, cable and suspenders, Philadelphia-Gloucester bridge, Delaware River, Port Authority, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

3612 tons, section, state crossway, Bronx, New York, through Corbetta Construction Co., to Harris Structural Steel Co., New York city.

2100 tons, estimated, steel towers, 84-mile transmission line, Missouri river hydroelectric power project, Department of The Interior, eastern North Dakota and western Minnesota, to American Bridge Division, U. S. Steel Corp., Denver.

700 tons dormitory buildings, Clemson College, Clemson, S. C., to Greenville Steel & Foundry Co., Greenville, S. C.; Daniel Construction Co., Greenville, general contractor.

650 tons, office building, Wilmington, Del., through H. K. Ferguson Co., to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, 12-story apartment, 11 East 87th Street Corp., New York, to Grand Iron Works, that city.

500 tons, bridge, Conway, Pa., yard, Pennsylvania railroad, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

200 tons, building, race track, Camden, N. J., to Belmont Iron Works, Eddystone, Pa.

150 tons, elementary school building, Rockville, Conn., to Topper & Griggs, West Hartford, Conn.; A. F. Peaslee, Inc., Hartford, general contractor.

105 tons, state highway bridge, Rockingham, Vt., to Groisser & Shlager Iron Works, Somerville, Mass.; O. W. Miller Co., Inc., Ludlow, Mass., general contractor; 40 tons,

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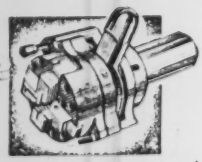

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By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

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69 illustrations Price $5.00 Postpaid

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concrete reinforcing bars. Truscon Steel Division, Republic Steel Corp., Boston.

105 tons, submarine battery overhaul shop, naval shipyard, Charleston, S. C., to B. I. Montague Co., Charleston; R. P. Farnsworth Construction Co., New Orleans, general contractor.

100 tons, state highway bridge; Merrimack-Nashua, N. H., to Lyons Iron Works, Manchester, N. H.; W. W. Wyman, Inc., Greenfield, Mass., general contractor.

STRUCTURAL STEEL PENDING

3000 tons, superstructure, Jamaica Bay crossing, New York City Transit Authority, bids Dec. 4.

3700 tons, state highway bridges, Ohio turnpike, Lucas county; bids Dec. 10, Ohio Turnpike Commission, Columbus, O.

3500 tons or more, 5 schedules, 43 main unit gates and appurtenances, 4 fish turbine intake gates, also 86 additional gates, lattices, etc., The Dalles dam, Columbia river, Guy F. Atkinson Co. for Willamette Iron & Steel Works, Portland, Oreg.; low on all schedules, $2,320,730 to U. S. Engineer, Portland.

3100 tons, section, State thruway, Rockland county, New York; bids Dec. 3.

2400 tons, hangar, Westover Air Field Base, Chicopee, Mass., Rich Co., Stamford, Conn., low.

2200 tons, section, State thruway, Westchester county, New York; bids Dec. 3.

1000 tons, high school, Queens, New York; bids Dec. 8.

800 tons, store, W. T. Grant Co., Philadelphia, bids asked.

750 tons, Ebasco Corp., power house extension, Denver, Colo.; bids asked.

700 tons, 8-story nurses residence and school, New York City Department of Public Works, Jamaica, Long Island; bids Dec. 2.

500 tons, state bridge, Newark, Del., bids Dec. 2.

500 tons, building, Beneficial Management Corp., Morristown, N. J., bids asked.

240 tons, state highway bridge, Billerica-Chelmsford, Mass.

215 tons, highway bridges, Vermont, to be estimated shortly for spring construction; also 110 tons, reinforcing steel.

200 tons, 2-span composite beam bridge, Willimantic river and rolled beam bridge over Central Vermont railway, Willington-Tolland-Ellington, Conn.; bids Dec. 7, Hartford, Conn.

187 tons, section, State thruway, Westchester county, New York; bids Dec. 3.

160 tons, three state bridges, Mid-Cape highway, Barnstable-Yarmouth, Mass.; bids Dec. 8, Boston.

100 tons, public school No. 62, Queens, New York; bids Nov. 24; structure is to be built principally of reinforced concrete.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, dormitory buildings, Clemson College, Clemson, S. C., to Connors Steel Co., Birmingham; Daniel Construction Co., Greenville, S. C., general contractor.

600 tons, office building, Fulton National Bank, Atlanta, to Hall Steel Co., Atlanta; Henry C. Beck Co., Atlanta, general contractor.

475 tons, county general hospital, Huntington, W. Va., to West Virginia Steel & Manufacturing Co., Huntington; Southwestern Construction Co., Charleston, W. Va., general contractor.

410 tons, continued treatment building, state hospital, Norwich, Conn., to Scherer Steel Co., Hartford, Conn.; Mandelci & Benvenuti, New London, Conn., general contractors.

295 tons, East low canal, Columbia basin project, to Bethlehem Pacific Coast Steel Corp., Seattle; Otis Williams & Co., general contractor.

140 tons, submarine battery overhaul shop, naval shipyard, Charleston, S. C., to Atlantic Steel Co., Atlanta; R. P. Farnsworth Construction Co., New Orleans, general contractor.

REINFORCING BARS PENDING

2000 tons, state highway bridges, Ohio turnpike, Lucas county; bids Dec. 10, Ohio Turnpike Commission, Columbus, O.; also 352,000 square yards 10-inch reinforced concrete pavement.

265 tons, state bridges, Anvets highway, Brockton-West Bridgewater, Mass., section, bids Dec. 1, Boston.

155 tons, three state bridges, Mid-Cape highway, Barnstable-Yarmouth, Mass.; bids Dec. 8, Boston.

PLATES . . .

PLATES PENDING

150 tons, Raritan arsenal, Metuchen, N. J.; bids in to contracting officer, Inv. 73.

100 tons, plus, tankage at Hanford Works; bids to the Atomic Energy Commission, Richland, Wash., Dec. 9.

PIPE . . .

CAST IRON PIPE PLACED

50 tons or more, 2300 feet 6-inch, to Pacific States Cast Iron Pipe Co., Seattle, by King County District No. 42.

STEEL PIPE PENDING

Unstated, 20,000 feet 8- to 4-inch steel pipe and accessories, three schedules, for King County District No. 76; bids to Parker, Hill & Ingman, Seattle, engineers, Dec. 1.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Ft. Dodge, DesMoines & Southern, three 600-hp 70-ton diesel units, to General Electric Co., Schenectady, N. Y.

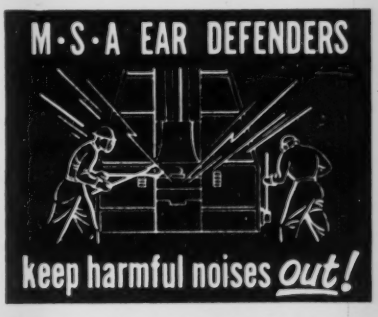
RAILROAD CARS PLACED

Chicago, Rock Island & Pacific, one 125-ton depressed center flat car, to its Blue Island, Ill., shops; car body will be cast in one piece by the General Steel Castings Co., Granite City, Ill.

Pennsylvania, twenty 50-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILS PLACED

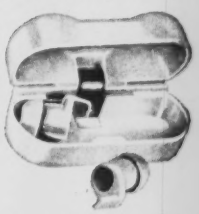
Louisville & Nashville, 10,000 tons of 132-pound rail, to Tennessee Coal & Iron Division, U. S. Steel Corp.



If your workers "can't hear themselves think," chances are *you'll* hear about it in lowered production and damaged hearing.

Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversation.

M.S.A. Ear Defender design insures comfortable fit; complete closure of ear canal; easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.



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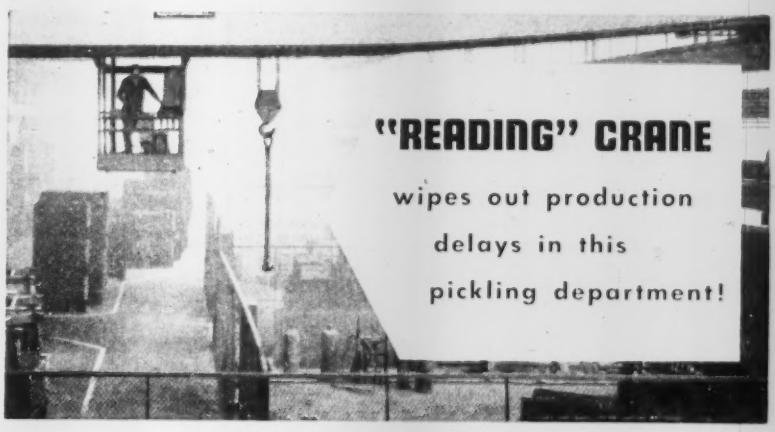
Pittsburgh 8, Pa.



A prominent producer of automobile frames found production slipping. Figuring it was due to inefficient load handling equipment in his pickling room, he called in a "Reading" handling engineer.

After installing a 10-ton "Reading" overhead traveling crane he found his problem solved. Now the operator simply pushes a button. The motorized crane, traveling 400 feet per minute, does all the work.

Employee morale is higher because fatigue is eliminated. And the extra efficiency obtained resulted in improved production.

Further information on "Reading" Electric Cranes will enable you to judge their advantages for your own load handling operations. Get our latest 16-page bulletin, "The *Why* and *How* of Faster Production." Write to:

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Electric Hoists
Overhead
Traveling
Cranes

READING CRANES

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Nov. 25	$31.67
Nov. 19	35.00
Oct. avg.	32.75
Nov. 1952	43.00
Nov. 1948	43.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting *$38.00-39.00*
No. 2 heavy melting *37.00-37.00*
No. 1 bundles 36.00-37.00
No. 2 bundles *37.00-37.00*
No. 1 busheling 36.00-37.00
Machine shop turnings 21.00-22.00
Mixed borings, turnings 21.00-22.00
Short shovel turnings 25.00-26.00
Cast iron borings 24.00-25.00
Cut structurals 40.00-41.00
Heavy turnings 31.00-32.00
Punchings & plate scrap 40.00-41.00
Electric furnace bundles 40.00-41.00

Cast Iron Grades

No. 1 cupola *47.00-48.00*
Charging box cast *47.00-48.00*
Heavy breakable cast 36.00-37.00
Unstripped motor blocks 33.00-34.00
No. 1 machinery cast 46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt. $42.00-43.00
Rails, 2 ft and under *49.00-50.00*
Rails, 18 in. and under 50.00-51.00
Rails, random lengths 44.00-45.00
Railroad specialties 44.00-45.00

Stainless Steel Scrap

18-8 bundles & solids	165-170
18-8 turnings	90-95
430 bundles & solids	87-90
430 turnings	60-62

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting *$37.00-38.00*
No. 2 heavy melting *28.00-29.00*
No. 1 bundles *37.00-38.00*
No. 2 bundles 27.00-28.00
No. 1 busheling *37.00-38.00*
Machine shop turnings 18.00-19.00
Mixed borings, turnings 23.00-24.00
Short shovel turnings 23.00-24.00
Cast iron borings 23.00-24.00
Low phos. *37.00-38.00*
Alloy free, short shovel turnings 25.00-26.00
Electric furnace bundles *37.00-38.00*

Cast Iron Grades

No. 1 cupola 43.00-44.00
Charging box cast 31.00-32.00
Stove plate 38.00-39.00
Heavy breakable cast 27.00-28.00
Unstripped motor blocks 26.00-27.00
Brake shoes *35.00-36.00*
Clean auto cast *43.00-44.00*
No. 1 wheels 41.00-42.00
Burnt cast *32.00-33.00*
Drop broken machinery *43.00-44.00*

Railroad Scrap

No. 1 R.R. heavy melt *37.00-38.00*
R.R. malleable 45.00-46.00
Rails, 2 ft and under *49.00-50.00*
Rails, 18 in. and under 50.00-51.00
Rails, random lengths *43.00-44.00*
Cast steel *41.00-42.00*
Railroad specialties *41.00-42.00*
Uncut ties *37.00-38.00*
Angles, splice bars 45.00-46.00
Rails, rerolling 49.00-50.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids
nom. 160.00-170.00
18-8 turnings nom. 70.00-80.00
430 clips, bundles, solids nom. 70.00
430 turnings nom. 50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting *37.00-38.00*
No. 2 heavy melting *31.00-32.00*
No. 1 bundles *37.00-38.00*
No. 2 bundles *29.00-30.00*
Machine shop turnings 17.00-18.00
Short shovel turnings 25.00-26.00
Cast iron borings 25.00-26.00
Low phos *38.00-39.00*
Electric furnace bundles *38.00-39.00*

Railroad Scrap

No. 1 R.R. heavy melt. *36.00-37.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting 35.00
No. 2 heavy melting 32.00
No. 1 bundles 35.00
No. 2 bundles 30.00
No. 1 busheling 35.00
Electric furnace bundles 36.00-37.00
Machine shop turnings 22.00
Mixed borings, turnings *24.50*
Short shovel turnings 25.00
Structurals & plate 38.50
Heavy turnings 31.00-31.50
Coilsheets, spring wheels 42.00
Rail ends, 2 ft & under *48.00-50.00*

Cast Iron Grades

No. 1 cupola 35.00-36.00
Charging box cast nom.
Heavy breakable cast 40.00
Unstripped motor blocks 28.00
Drop broken machinery 42.00-43.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting 27.00-28.00
No. 2 heavy melting 24.50-25.00
No. 1 bundles 27.00-28.00
No. 2 bundles 22.50-23.50
Machine shop turnings 13.50-14.50
Mixed borings, short turnings 18.00-19.00
Low phos. (structural & plate) 29.50
Short shovel turnings 19.00-20.00

Cast Iron Grades

No. 1 cupola 29.00-30.00
Unstripped motor blocks 21.00-22.00

Stainless Steel

18-8 sheets, clips solids	165.00-175.00
18-8 borings, turnings	85.00-90.00
430 sheets, clips, solids	80.00-85.00
410 sheets, clips, solids	70.00-75.00

BOSTON

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting 25.00-26.00
No. 2 heavy melting *24.25-24.75*
No. 1 bundles 24.00-25.00
No. 2 bundles *19.25-19.50*
Machine shop turnings *14.50-14.00*
Mixed borings, turnings *16.50-17.00*
Short shovel turnings *17.50-18.00*
No. 1 cast 29.00-30.00
Mixed cupola cast 27.00-28.00
No. 1 machinery cast 36.00-37.00

CINCINNATI

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting *37.00-37.50*
No. 2 heavy melting *28.00-29.00*
No. 1 bundles *37.00-37.50*
No. 2 bundles *25.00-26.00*
No. 1 busheling *37.00-37.50*
Machine shop turnings 15.00-16.00
Mixed borings, turnings *18.00-19.00*
Short shovel turnings *18.00-19.00*
Cast iron borings *18.00-19.00*
Low phos., 18-in. 39.00-40.00

Cast Iron Grades

No. 1 cupola 38.00
Heavy breakable cast 35.00
Charging box cast 35.00
Drop broken machinery 46.00

Railroad Scrap

No. 1 R.R. heavy melt 34.00-35.00
Malleable 42.00-43.00
Rails, 18-in. and under 48.00-49.00
Rails, random lengths 39.00-40.00

CHICAGO

No. 1 heavy melting 33.00-34.00
No. 2 heavy melting 28.00-29.00
No. 1 factory bundles 34.00-35.00
No. 1 dealer bundles 32.00-34.00
No. 2 bundles 26.00-27.00
No. 1 busheling 33.00-34.00
Machine shop turnings 16.00-17.00
Mixed borings, turnings *16.00-17.00*
Short shovel turnings 18.00-19.00
Cast iron borings 18.00-19.00
Cut structurals, 3-ft 37.00-38.00
Punchings & plate scrap 37.00-38.00
Electric furnace bundles 36.00-37.00

Cast Iron Grades

No. 1 cupola 34.00-35.00
Stove plate 29.00-30.00
Unstripped motor blocks 19.00-20.00
Clean auto cast *38.00-40.00*
Drop broken machine *38.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt 35.00-36.00
R.R. Malleable 40.00-41.00
Rails, 2 ft and under 46.00-48.00
Rails, 18 in. and under 48.00-50.00
Angles, splice bars 40.00-42.00
Rails, rerolling 45.00-47.00

Stainless Steel Scrap

18-8 clips & solids	140.00-160.00
18-8 turnings	nom. 70.00
430 clips & solids	70.00
430 turnings	nom. 30.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting 29.00
No. 2 heavy melting 23.00
No. 1 bundles 29.00
No. 2 bundles 23.00
No. 1 busheling 29.00
Machine shop turnings 14.00
Mixed borings turnings 14.00
Short shovel turnings 15.00
Punchings & plate scrap 30.00

Cast Iron Grades

No. 1 cupola 40.00
Charging box cast 33.00
Stove plate 34.00-35.00
Heavy breakable 29.00-30.00
Unstripped motor blocks 30.00
Clean auto cast 40.00
Malleable 40.00

BUFFALO

No. 1 heavy melting 34.00-35.00
No. 2 heavy melting 31.00-31.50
No. 1 bundles 34.00-35.00
No. 2 bundles 29.00-29.50
No. 1 busheling 34.00-35.00
Machine shop turnings 21.50-22.50
Mixed borings, turnings 23.50-24.00
Short shovel turnings 24.50-25.00
Cast iron borings 23.50-24.00
Low phos. 38.00-39.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola 34.00-35.00
No. 1 machinery 39.00-40.00

Railroad Scrap

Rails, random lengths 41.00-42.00
Rails, 2 ft and under 46.00-47.00
Railroad specialties 44.00-45.00

BIRMINGHAM

No. 1 heavy melting 26.00-26.50
No. 2 heavy melting 24.00-24.50
No. 1 bundles 26.00-26.50
No. 2 bundles 22.00-22.50
Machine shop turnings 19.50-20.50
Short shovel turnings 20.50-21.50
Cast iron borings 20.50-21.50
Cut structurals nom.
Electric furnace bundles nom.

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola 41.00-42.50
Charging box cast 30.00-31.00
Stove plate 38.00-38.00
Bar crops and plate 38.00-39.00
Cut structurals 36.00-37.00
Heavy breakable cast 30.00-31.00
Unstripped motor blocks 34.00-35.00
No. 1 wheels 46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt nom.
Rails, 2-ft and under 42.00-43.00
Rails, random lengths 39.00-40.00
Angles, splice bars 38.00-39.00
Rails, rerolling 46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting 33.00
No. 2 heavy melting 29.00-30.00
No. 1 bundles 33.00
No. 2 bundles 27.00-28.00
Machine shop turnings 14.00-15.00
Short shovel turnings 15.00

Cast Iron Grades

No. 1 cupola 38.00-39.00
Charging box cast 29.00-30.00
Heavy breakable cast 31.00-32.00
Unstripped motor blocks 29.00-30.00
Brake shoes 37.00-38.00
Clean auto cast 39.00-40.00
Burnt cast 31.00-32.00

Railroad Scrap

Malleable 37.00-38.00
Rails, 18-in. and under 47.00-48.00
Rails, random lengths 41.00-42.00
Rails, rerolling 48.00-49.00
Uncut ties 33.00-34.00
Angles, splice bars 37.00-38.00

SEATTLE

(delivered consumer plant)

No. 1 heavy melting 31.00
No. 2 heavy melting 27.00
No. 1 bundles 24.00
No. 2 bundles 19.00
No. 3 bundles 15.00
Machine shop turnings 12.00-12.50
Mixed borings, turnings 12.00-12.50
Short shovel turnings 12.00-12.50
Electric furnace, No. 1 36.00-38.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola 30.00-35.00
Heavy breakable cast 25.00-30.00
Unstripped motor blocks 27.00
No. 1 wheels 38.00-40.00
Stove plate 29.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths 30.00-34.00

SAN FRANCISCO

No. 1 heavy melting 23.00
No. 2 heavy melting 19.00
No. 1 bundles 22.00
No. 2 bundles 19.00
No. 1 busheling 24.00
Machine shop turnings 7.00
Mixed borings, turnings 7.00
Short shovel turnings 11.00
Cast iron borings 11.00
Cut structurals 28.00
Heavy turnings 11.00
Punchings & plate scrap 28.00
Electric furnace bundles 22.00

Cast Iron Grades

No. 1 cupola 39.00
Charging box cast 35.00
Stove plate 37.00
Heavy breakable cast 36.00
Unstripped motor blocks 29.00
Brake shoes 35.00
Clean auto cast 39.00
No. 1 wheels 39.00
Burnt cast 23.00
Drop broken machinery 43.00

LOS ANGELES

No. 1 heavy melting 23.00
No. 2 heavy melting 19.00
No. 1 bundles 22.00
No. 2 bundles 19.00
Machine shop turnings 7.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola 40.00-41.00

HAMILTON, ONT.

(Delivered prices)

Heavy melting $32.50
No. 1 bundles 32.50
No. 2 bundles 32.50
Mechanical bundles 28.50
Mixed steel scrap 28.50
Mixed borings, turnings 22.50
Rails, remelting 32.50
Rails, rerolling 41.50
Busheling 26.50
Busheling new factory:
Prep'd 30.50
Unprep'd 28.50
Short steel turnings 22.50

Cast Iron Grades†

No. 1 machinery cast 46.00

†F.o.b. shipping point.

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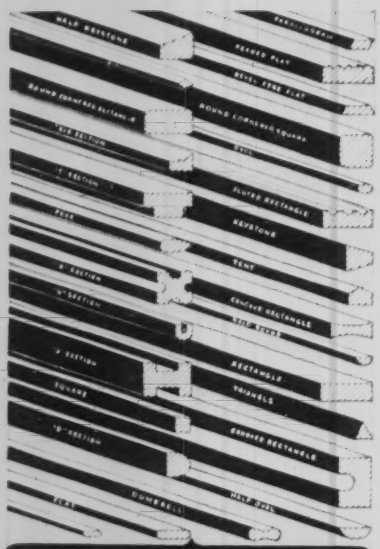

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32" x 23' centers, PITTSBURGH Lathe, Timken Bearings, two carriage with power traverse to each, late type.
30" x 14' American G. H. Lathe, 12 speeds.
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Sellers 6 T Tool Grinder, late type.
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King 42" Vertical Boring Mill, 2 heads.
Niles 36-44 Boring Mill.
Niles 42"-50" Driving Box Borer, Burnisher & Facer, late type.
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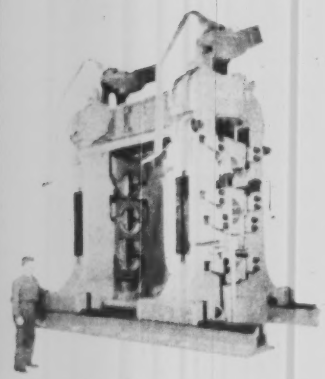

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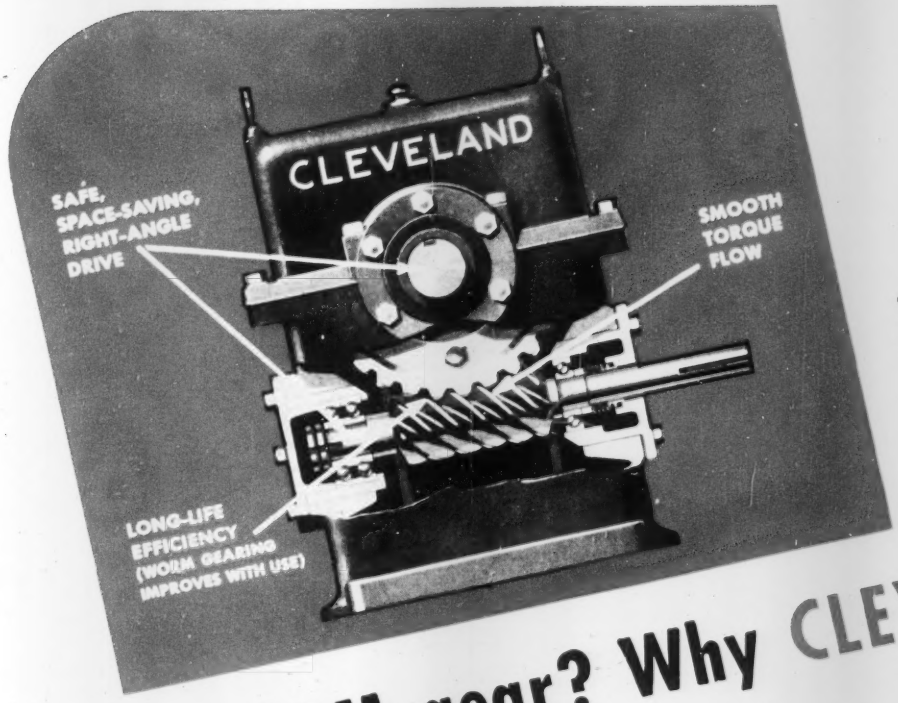

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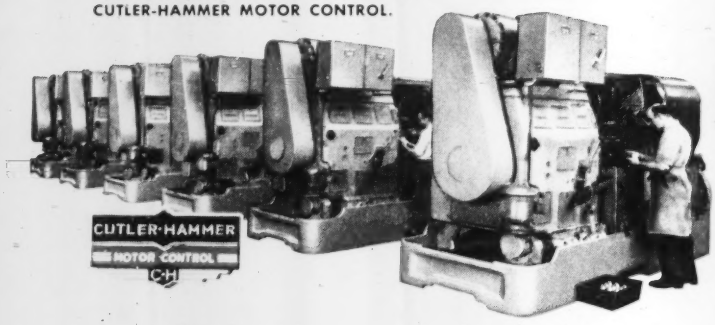

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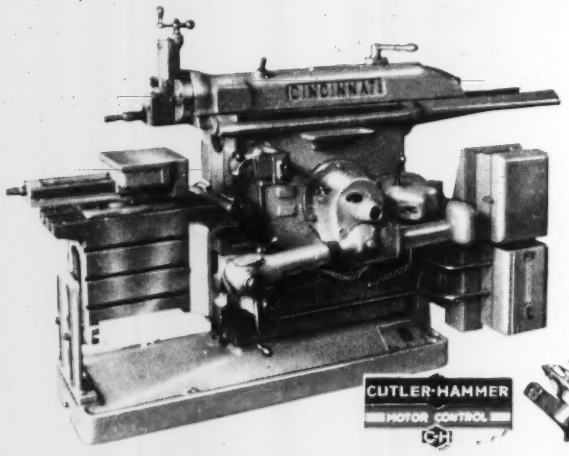
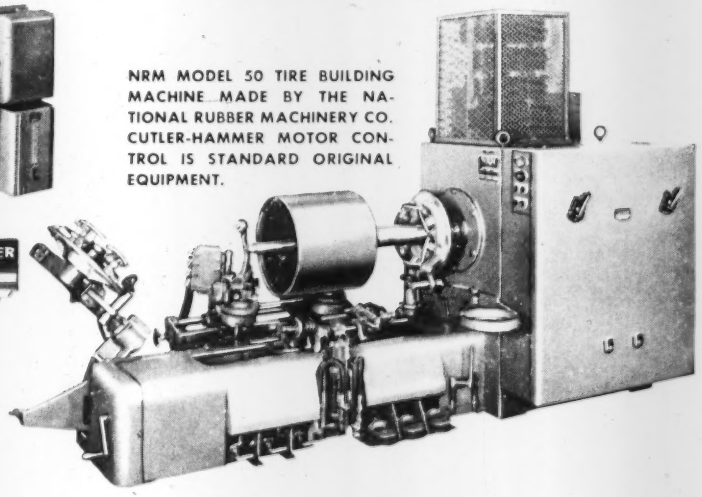


CINCINNATI 20" RAPID TRAVERSE SHAPER MADE BY THE CINCINNATI SHAPER CO. CUTLER-HAMMER MOTOR CONTROL IS STANDARD ORIGINAL EQUIPMENT.

NRM MODEL 50 TIRE BUILDING MACHINE MADE BY THE NATIONAL RUBBER MACHINERY CO. CUTLER-HAMMER MOTOR CONTROL IS STANDARD ORIGINAL EQUIPMENT.



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